

**TOSHIBA**

FILE NO. 020-9913

SERVICE MANUAL

# COLOR TELEVISION

N9SS Chassis

***TZ50V61, TZ50V51***  
(TAC9950) (TAC9951)

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### APPENDIX:

#### CIRCUIT DIAGRAM

## CHAPTER 1 GENERAL ADJUSTMENTS

### SAFETY INSTRUCTIONS

**WARNING:** BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" INSTRUCTIONS BELOW.

#### X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not be above the specified limit. The nominal value of the high voltage of this receiver is (A) kV at zero beam current (minimum brightness) under a 120V AC power source. The high voltage must not, under any circumstances, exceed (B) kV.  

Refer to table-1 for high voltage (A), (B).  
(See SETTING & ADJUSTING DATA on page 19)

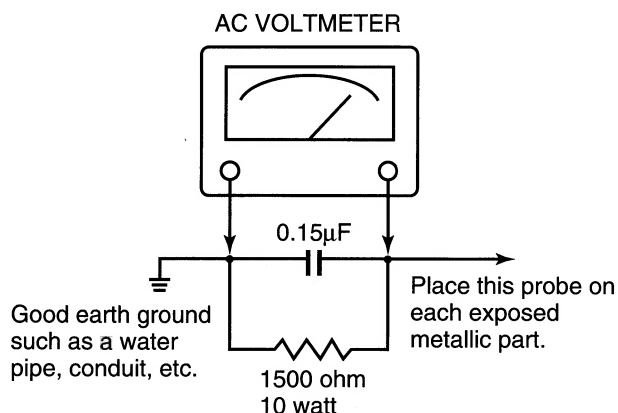
Each time a receiver requires servicing, the high voltage should be checked following the HIGH VOLTAGE CHECK procedure in this manual. It is recommended that the reading of the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.
2. This receiver is equipped with a Fail Safe (FS) circuit which prevents the receiver from producing an excessively high voltage even if the B+ voltage increases abnormally. Each time the receiver is serviced, the FS circuit must be checked to determine that the circuit is properly functioning, following the FS CIRCUIT CHECK procedure in this manual.
3. The only source of X-RAY RADIATION in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.
4. Some part in this receiver have special safety-related characteristics for X-RAY RADIATION protection. For continued safety, parts replacement should be undertaken only after referring to the PRODUCT SAFETY NOTICE below.

#### SAFETY PRECAUTION

**WARNING :** Service should not be attempted by anyone unfamiliar with the necessary precautions on this receiver. The following are the necessary precautions to be observed before servicing this chassis.

1. An isolation Transformer should be connected in the power line between the receiver and the AC line before any service is performed on the receiver.
2. Always discharge the picture tube anode to the CRT conductive coating before handling the picture tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled. Use shatter proof goggles and keep picture tube away from the unprotected body while handling.
3. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as; non-metallic control knobs, insulating covers, shields, isolation resistor-capacitor network etc.
4. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, screwheads, metal overlays, control shafts etc. to be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into a 120V AC outlet (do not use a line isolation transformer during this check). Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner:

Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15  $\mu$ F, AC type capacitor, between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and 0.15  $\mu$ F capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.3 volts rms. This corresponds to 0.2 milliamp. AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



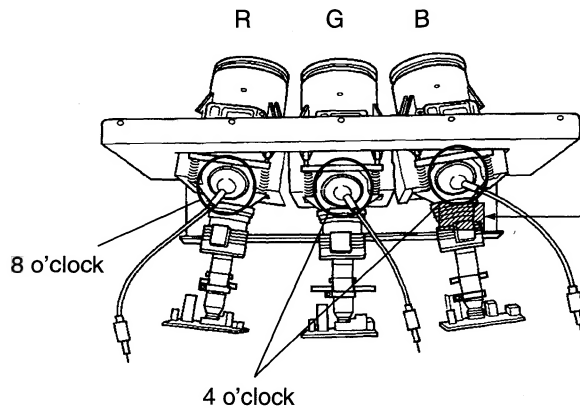
#### PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the international hazard symbols on the schematic diagram and the parts list.

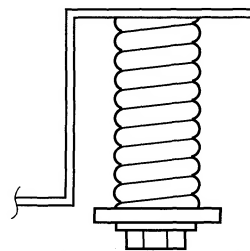
Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire, X-ray radiation or other hazards.

## CRT ASSEMBLY REPLACEMENT AND MOUNTING

**CAUTION : DO NOT LOOSEN THE HEX HEAD BOLTS WITH SPRINGS (12 PCS), BECAUSE THOSE ARE FOR SEALING OF CRT COOLANT.**

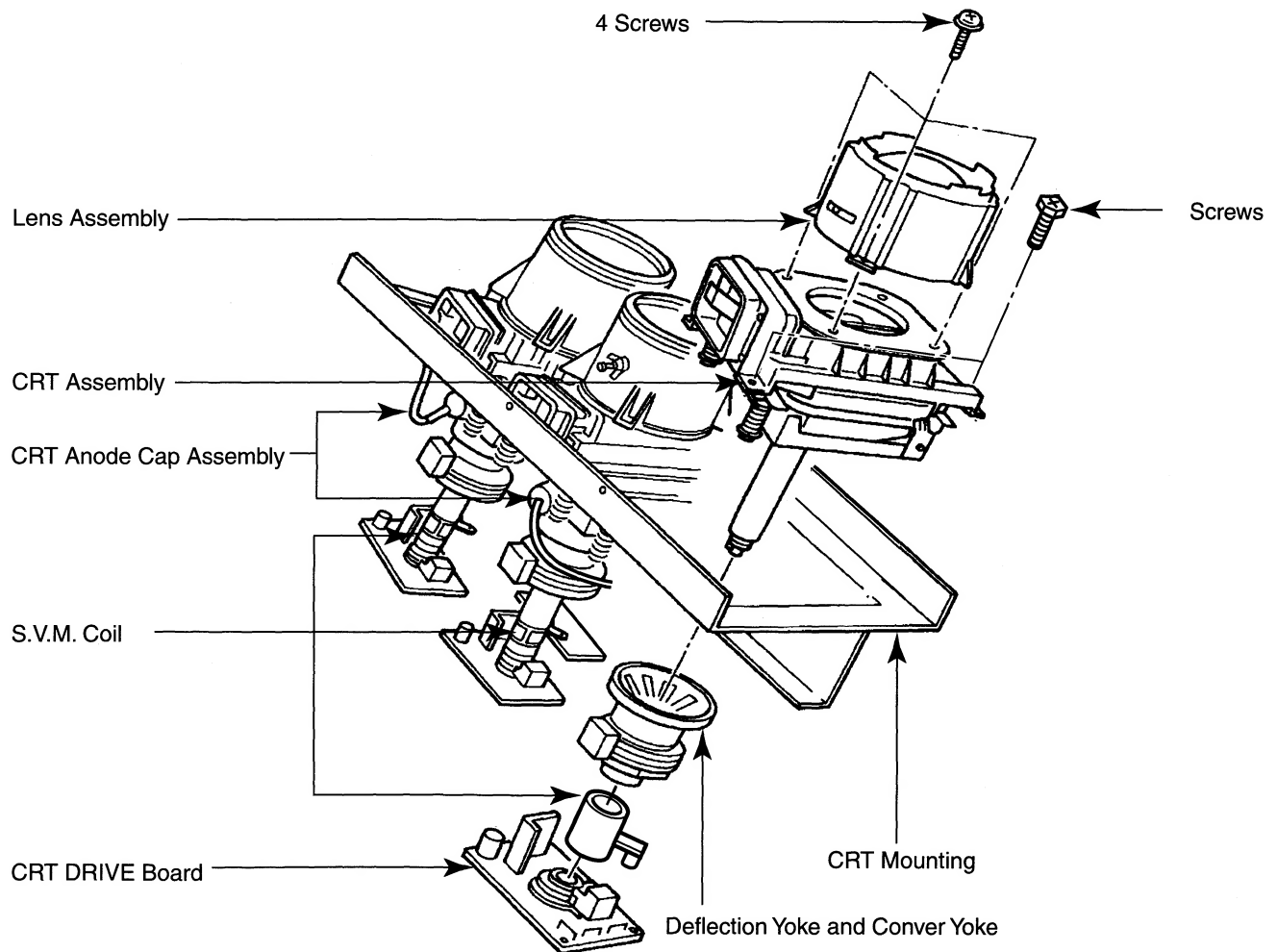


### Attention Serviceman



The Hex Head Bolts with Springs. (see sketch) used on CRT assembly, are "NOT"

Adjustment Screws  
**DO NOT LOOSEN-FLUID LEAKAGE WILL OCCUR.**



Lens and Neck Components View



**TO REMOVE CRT (Same procedure for R, G, B)**

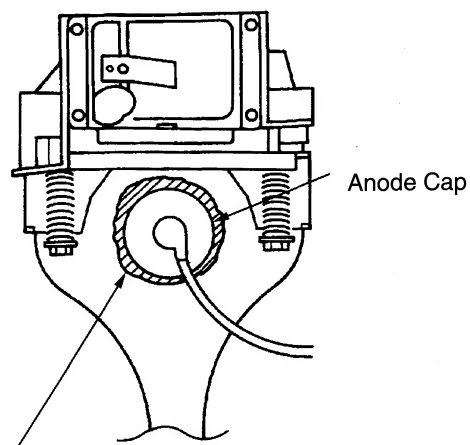
1. Remove CRT DRIVE Board, S. V. M. COIL and DEF. YOKE from CRT.
2. Remove Lens Assembly.
3. Detach CRT Anode Cap from CRT.
4. Remove CRT Assembly from CRT Mounting.

**CRT REPLACEMENT (Same procedure for R, G, B)**

Reverse the removal procedures except the followings.

1. Anode Cable should be replaced with new one.  
See "SERVICING PRECAUTIONS" shown below.
2. Install silicon (T461B) to the CRT, replace the Anode cable and put enough silicon again on around the Anode Cap as illustrated.

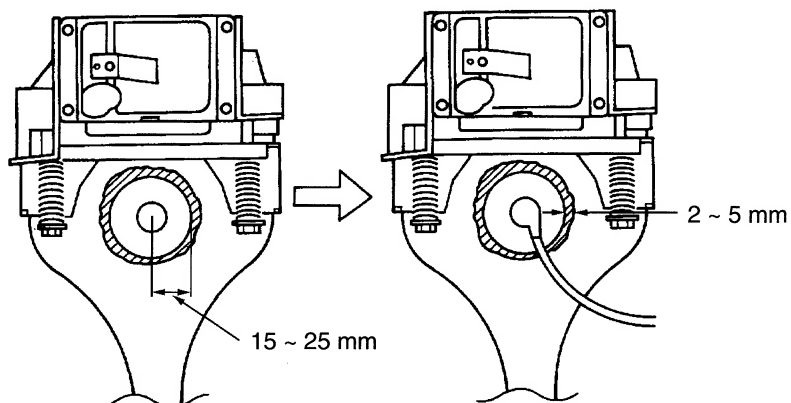
**CAUTION:** Align the Anode cable as illustrated on page 4.



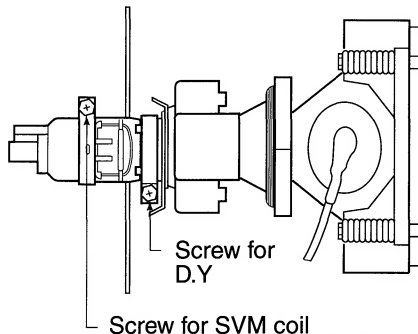
Silicon  
(On shaded area)  
TSE3843W #23960136

**ADJUSTING PROCEDURE IN REPLACING CRT**

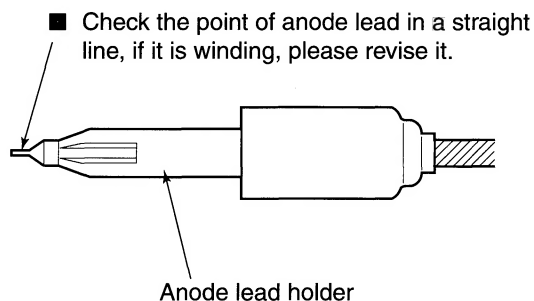
1. R.G.B. FOCUS ADJUSTMENT (page 6.)
  2. PICTURE TILT ADJUSTMENT (page 6.)
  3. USER CONVERGENCE CENTER CHECK  
(See owner's manual.)
  4. CENTERING ADJUSTMENT (page 6.)
  5. CONVERGENCE ADJUSTMENT (page 15.)
  6. WHITE BALANCE ADJUSTMENT (page 14.)
- Adjustments are complete.

**SERVICING PRECAUTIONS**

- Do not use a magnetized screw driver for screws of Deflection Yoke and Velocity Modulation Coil to avoid magnetization of electron gun. Magnetization of electron gun will degrade basic function and result in unbalance of right and left shift of user static convergence, and result in no variable quantity.



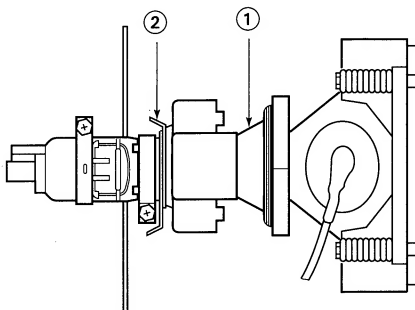
- When replacing the anode cap assembly (CRT) or anode lead assembly (F.B.T.), remove the anode lead holder from old one and attach the holder again to new anode lead.



**WARNING :** BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 3 OF THIS MANUAL.

## PICTURE TUBE COMPONENTS ADJUSTMENT

### DESCRIPTION OF NECK COMPONENTS



- ① Deflection yoke and convergence yoke  
The position on the neck is required most front (CRT funnel side) and the screw is fastened after rotating yoke adjusting picture tilt.
- ② Centering magnet  
After adjusting picture tilt, picture position is finally fixed by this magnet.  
In order to get maximum margin of user convergence control for center of screen, this magnet have to be used for center convergence adjustment.

### PREPARATION

Operate the receiver for at least 5 minutes.

### R, G, B FOCUS ADJUSTMENT

1. Before adjusting the R, G, B FOCUS, remove the 4 screws of Lens Assembly which is fixed on the CRT Assembly. (See page 4.)  
Then turn around the Lens Assembly by 180° to adjust the fastening screw (Fig. a) and fasten the 4 screws to secure Lens Assembly.
2. Select the adjustment mode. (See page 9.)
3. Press "7" button to display the built-in cross-hatch.
4. Press "0" and "RTN" buttons to make the picture a single Red color.  
100 button ..... to erase Red color  
0 button ..... to erase Green color  
RTN button ..... to erase Blue color
5. Loosen the fasten screw and adjust Red lense focus to best focusing point of picture center. Then fasten the screw. (See Fig. a.)

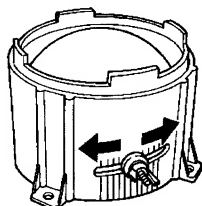


Fig. a

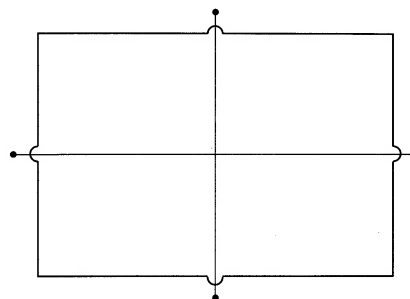
6. Adjust FOCUS VR "R" of FOCUS PAC to find best focusing point of picture center.
7. Repeat steps 3 to 5 for Green and Blue colors.

### TILT ADJUSTMENT

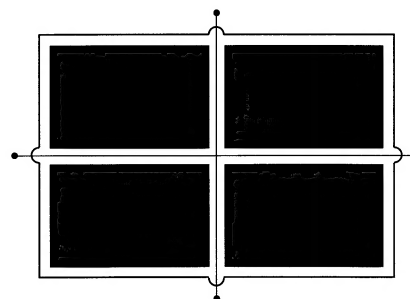
Rotate R, G, B deflection yoke so that picture becomes horizon, then fasten screw.

### CENTERING ADJUSTMENT

1. Stretch a thread between two center slots of screen edge (top and bottom, left and right).

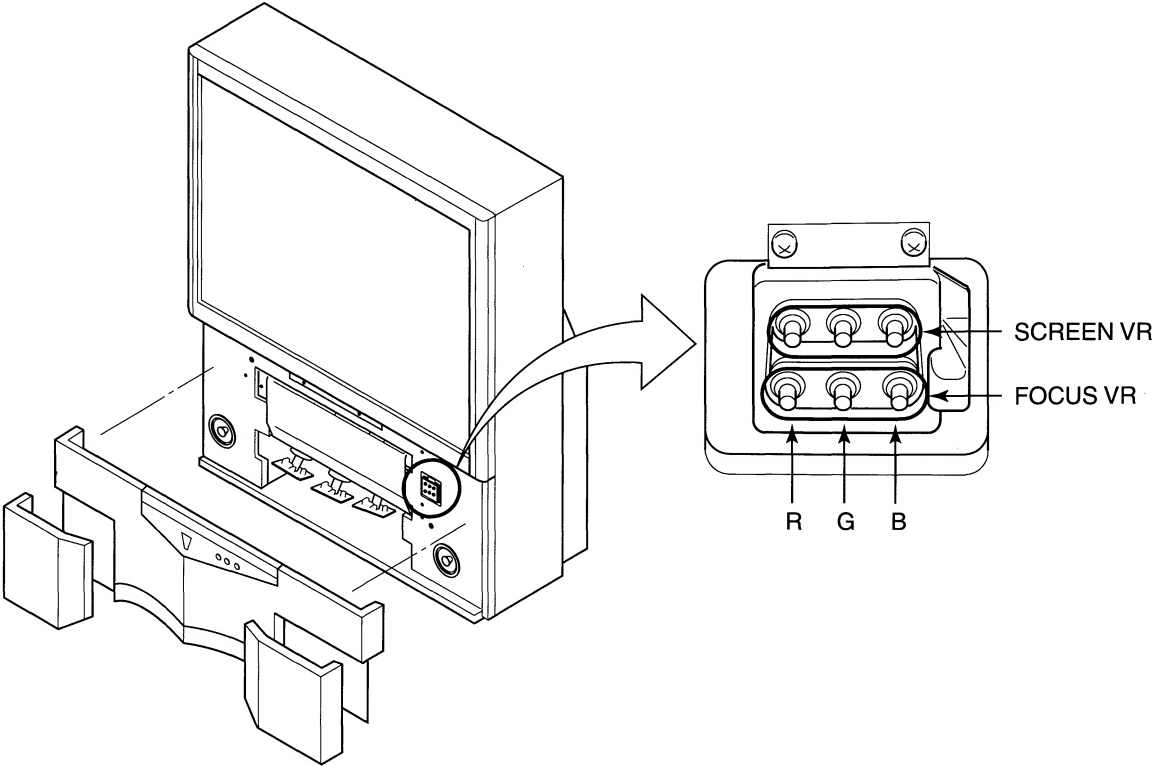


2. Select the adjustment mode.
3. Press TV/VIDEO button on the Remote Control to display the white cross-bar.



4. Adjust G centering magnet so that the cross-bar pattern center comes to screen center.
5. Perform HEIGHT adjustment. (See page 13.)
6. Perform VERT. LINEARITY adjustment.
7. Perform WIDTH adjustment. (See page 13.)
8. Check whole quality of green line.
9. Adjust R, B centering magnet so that the cross-bar pattern center comes to screen center.

LOCATION OF SCREEN AND FOCUS VR'S

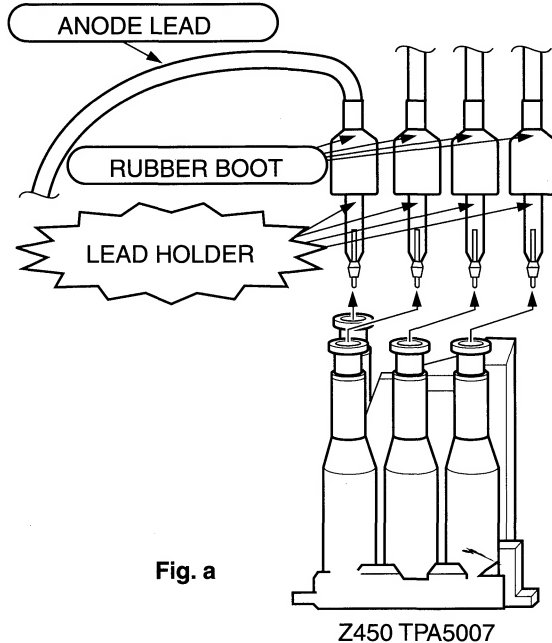


## REPLACEMENT OF THE CRT

Service parts are provided for each R, G and B.  
The contents of the parts are as follows.

		R	G	B
HITACHI CRT	TZ50V61	23796001	23796002	23796003
	TZ50V51	↑	↑	↑
	TZ55V61	23796311	↑	23796313
	TZ61V61	23796485	↑	23796486
	TZ43V61	23003591	23003592	23003593
TOSHIBA CRT	TE50T11	23003795	23003796	23003796
	TE55T11	23003807	↑	↑
	TN43V71	23003798	23003799	23003800
	TN50V71	23003795	23003796	23003797
	TN55V71	(New)	↑	↑

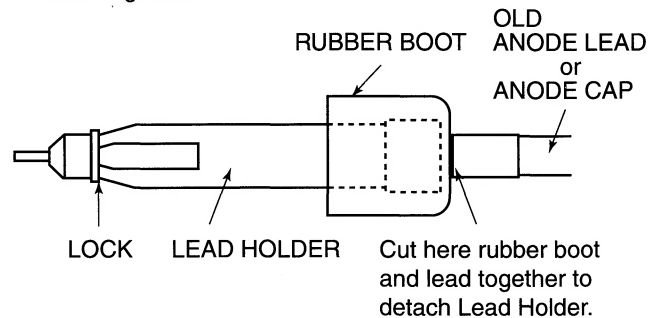
### REPLACEMENT OF HIGH VOLTAGE CABLE



1. When replacing Anode Lead or Anode Cap with new one, remove Lead Holder from old lead as shown in figure below, and put it on new lead. Do not throw away Lead Holder.

**NOTE : THE LEAD HOLDER IS ATTACHED TO TPA5007 (Z450), BUT IS NOT ATTACHED TO ANODE LEAD AND ANODE CAP. RUBBER BOOT IS ATTACHED TO ANODE LEAD AND ANODE CAP.**

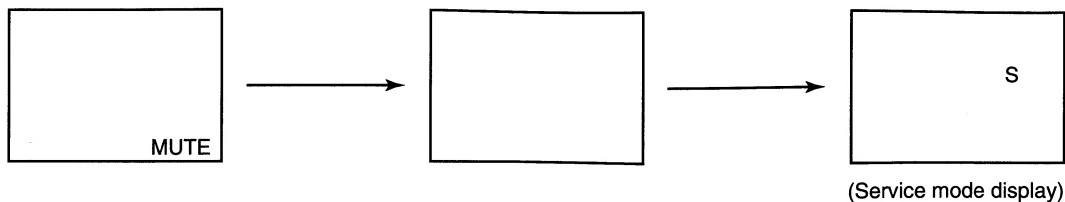
2. Detaching Lead Holder



## SERVICE MODE

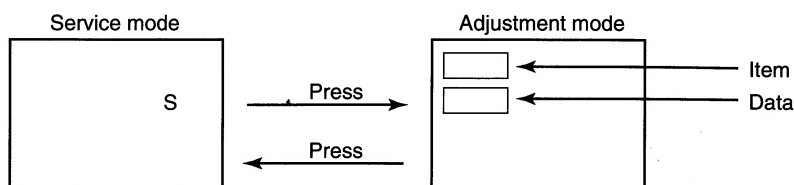
### 1. ENTERING TO SERVICE MODE

- 1) Press MUTE button once on Remote Control.
- 2) Press MUTE button again to keep pressing.
- 3) While pressing the MUTE button, press MENU button on TV set.



### 2. DISPLAYING THE ADJUSTMENT MENU

- 1) Press MENU button on TV.



### 3. KEY FUNCTION IN THE SERVICE MODE

The following key entry during display of adjustment menu provides special functions.

Screen adjustment mode ON/OFF:	TV (ANT)/VIDEO button (on TV)
Test signal selection :	TV (ANT)/VIDEO button (on Remote)
Selection of the adjustment items :	Channel ▲/▼ (on TV or Remote)
Change of the data value :	Volume ▲/▼ (on TV or Remote)
Adjustment menu mode ON/OFF :	MENU button (on TV)
Initialization of the memory (QA02) :	RECALL+Channel button on TV (▲)
Initialization of the self diagnostic data:	RECALL+Channel button on TV (▼)
"RCUT" selection :	1 button
"GCUT" selection :	2 button
"BCUT" selection :	3 button
"CNTX" selection :	4 button
"COLC" selection :	5 button
"TNTC" selection :	6 button
Convergence adj :	7 button
Test audio signal ON/OFF (1kHz) :	8 button
Self diagnostic display ON/OFF :	9 button

#### 4. SELECTING THE ADJUSTING ITEMS

- 1) Every pressing of CHANNEL ▲ button in the service mode changes the adjustment items in the order of table-2. (▼ button for reverse order)

Refer to table-2 for preset data of adjustment mode.  
(See SETTING & ADJUSTING DATA on page 19)

#### 5. ADJUSTING THE DATA

- 1) Pressing of VOLUME ▲ or ▼ button will change the value of data in the range from 00H to FFH. The variable range depends on the adjusting item.

#### 6. EXIT FROM SERVICE MODE

- 1) Pressing POWER button to turn off the TV once.

#### ■ INITIALIZATION OF MEMORY DATA OF QA02

After replacing QA02, the following initialization is required.

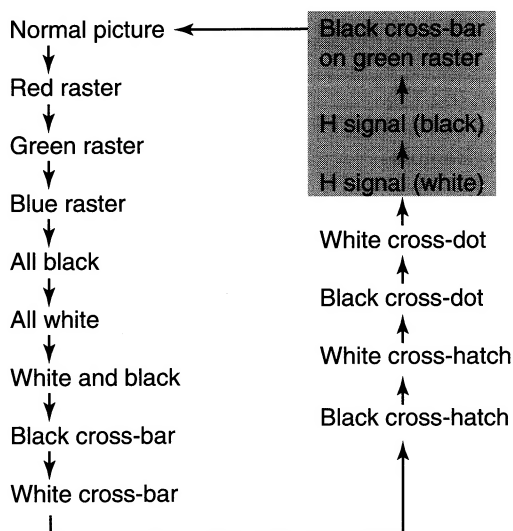
1. Enter the service mode, then select any register item.
2. Press and hold the RECALL button on the Remote, then press the CHANNEL ▲ button on the TV. The initialization of QA02 has been completed.
3. Check the picture carefully. If necessary, adjust any adjustment item above.

Perform "Programming Channel Memory" on the owner's manual.

CAUTION: Never attempt to initialize the data unless QA02 has been replaced.

#### 7. TEST SIGNAL SELECTION

- 1) Every pressing of TV/VIDEO button on the Remote Control in the Service mode, changes the built-in test patterns on screen in the following order.



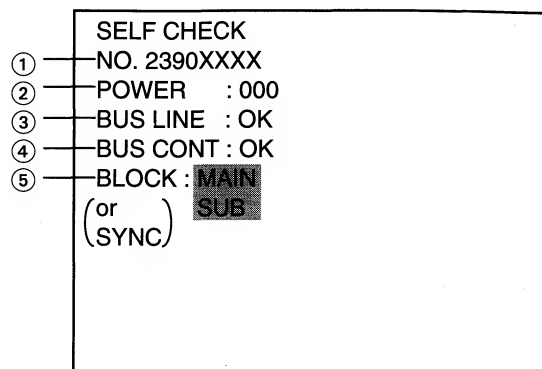
Note: If the video cable is connected to the VIDEO1 INPUT jack, the built-in pattern signals are not displayed.

Signals	Picture
<ul style="list-style-type: none"> <li>• Red raster</li> <li>• Green raster</li> <li>• Blue raster</li> <li>• All Black</li> <li>• All White</li> </ul>	
<ul style="list-style-type: none"> <li>• Black &amp; White</li> </ul>	
<ul style="list-style-type: none"> <li>• Black cross-bar</li> <li>• White cross-bar</li> <li>• Black cross-bar on green raster</li> </ul>	
<ul style="list-style-type: none"> <li>• Black cross-hatch</li> <li>• White cross-hatch</li> </ul>	
<ul style="list-style-type: none"> <li>• Black cross-dot</li> <li>• White cross-dot</li> </ul>	
<ul style="list-style-type: none"> <li>• H signal (white)</li> <li>• H signal (black)</li> </ul>	

\* The signals marked with ■ are not usable to display in the Test signal for some model.

## 8. SELF DIAGNOSTIC FUNCTION

- 1) Press "9" button on Remote Control during display of adjustment menu in the service mode.  
The diagnosis will begin to check if interface among IC's are executed properly.
- 2) During diagnosis, the following displays are shown.



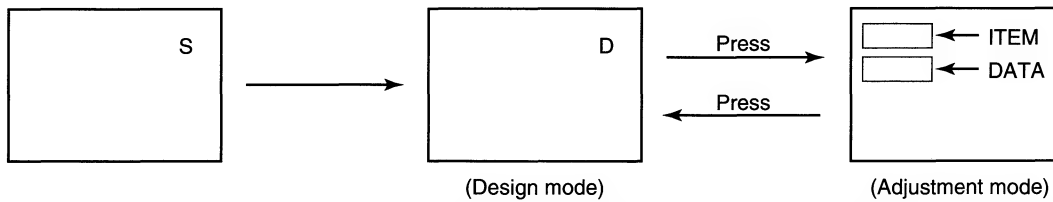
- ① Part number of microprocessor (QA01)
- ② Operation number of protection circuit (current limiter) . . . "000" is normal.
- ③ BUS line check — "OK" . . . . . Normal  
                               "SCL-GND" or "NG" . . . . . SCL-GND short circuit  
                               "SDA-GND" or "NG" . . . . . SDA-GND short circuit  
                               "SCL-SDA" or "NG" . . . . . SCL-SDA short circuit
- ④ BUS line ACK (acknowledge) check  
                               "OK" . . . . . Normal  
                               Display of Location Number . . . NG  
                               (Display example)  
                               "QA02 NG", "H001 NG", "Q501 NG" etc.  
                               Note: The indication of failure place is only one place though failure places are plural. When  
                                       repair of a failure place finishes, the next failure place is indicated. (The order of priority of  
                                       indication is left side.)
- ⑤ Sync. signal check — Green display . . . . . Normal  
                                       Cyan display . . . . . No check  
                                       Red display . . . . . NG  
                                       [ UV . . . . . TV mode  
                                       V1 . . . . . VIDEO 1 mode  
                                       V2 . . . . . VIDEO 2 mode ]  
                                       MAIN . . . . . Main sync  
                                       SUB . . . . . Sub sync (when turn on the PIP)

\* The item marked with ■ are not usable to display in the SELF DIAGNOSTIC FUNCTION for some model.

# DESIGN MODE

## 1. ENTERING TO DESIGN MODE

- 1) Select the Service mode.
- 2) While pressing RECALL button on Remote and press MENU button on TV.
- 3) Press MENU button on TV.



When QA02 is initialized, items "OPT0" and "OPT1" of DESIGN MODE are set to the data of the representative model of this chassis family.

Therefore, because ON-SCREEN specification remains in the state of the representative of model. This model is required to reset the data of items "OPT0" and "OPT1".

## 2. SELECTING THE ADJUSTING ITEMS

Every pressing of CHANNEL ▼ button in the design mode changes the adjustment items in the order table-3. (▲ button for reverse order)

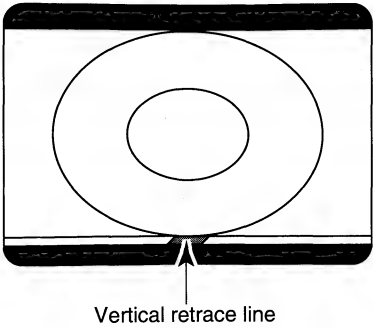
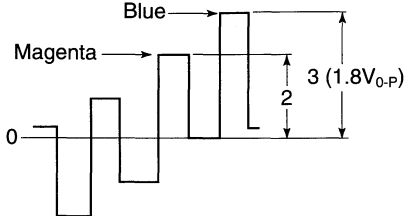
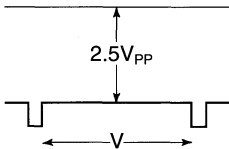
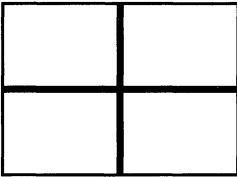
Refer to table-3 for data of design mode.  
(See SETTING & ADJUSTING DATA on page 19)

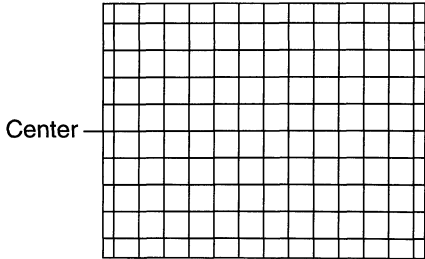
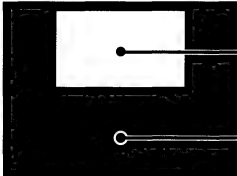
## 3. ADJUSTING THE DATA

Pressing of VOLUME ▲ or ▼ button will change the value of data.



# ELECTRICAL ADJUSTMENT

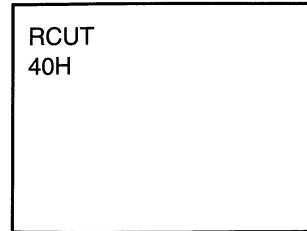
ITEM	ADJUSTMENT PROCEDURE
SUB-BRIGHTNESS (BRTC)	<ol style="list-style-type: none"> <li>1. Constrict the picture height until the vertical retrace line appears adjusting the HEIGHT control on the MAIN board.</li> <li>2. Adjust the CONTRAST to the minimum and BRIGHTNESS to the center.</li> <li>3. Enter the service mode, then select "BRTC" register.</li> <li>4. Adjust the data value so the belt of vertical retrace line just disappear.</li> <li>5. Adjust the HEIGHT control.</li> </ol> <p>* Adjust the SUB-BRIGHTNESS after adjusting the WHITE BALANCE.</p>  <p>Vertical retrace line</p>
SUB-COLOR (SCOL) SUB-TINT (TNTC)	<ol style="list-style-type: none"> <li>1. Receive color-bar signal from color-bar generator.</li> <li>2. Adjust the BRIGHTNESS and CONTRAST to the center (RESET status).</li> <li>3. Connect oscilloscope to TP501 on the MAIN board.</li> <li>4. Enter the service mode, then select "SCOL".</li> <li>5. Temporarily adjust the data value to achieve about 1V<sub>0-p</sub> of blue bar.</li> <li>6. Select "TNTC" register.</li> <li>7. Adjust the data value to obtain the blue bar to magenta bar ratio of 3:2 as shown.</li> <li>8. Select "SCOL" register.</li> <li>9. Adjust the data value to achieve 1.8V<sub>0-p</sub> of blue bar on scope.</li> <li>10. Check the picture with off-air signal.</li> </ol> 
SUB-CONTRAST (SCNT)	<ol style="list-style-type: none"> <li>1. Adjust the BRIGHTNESS and CONTRAST to normal mode(RESET).</li> <li>2. Enter the service mode, then select "SCNT" register.</li> <li>3. Press the TV/VIDEO button on remote control until the black cross-bar pattern appears on the screen.</li> <li>4. Measure TP-501 on V/C/D board, and adjust "SCNT" level to black cross-bar level is 2.5V (pp).</li> <li>5. Check the picture with off-air signal.</li> </ol> 
PICTURE POSITION	<ol style="list-style-type: none"> <li>1. Call up the adjustment mode display.</li> <li>2. Press the TV/VIDEO button until the white cross-bar or black cross-bar pattern appears on the screen.</li> <li>3. Adjust the picture position alternately by turning CENTERING MAGNETS for proper picture position.</li> <li>4. Check the picture with off-air signal.</li> </ol> 
HEIGHT (HIT)	<ol style="list-style-type: none"> <li>1. Call up the adjustment mode display, then select the item HIT.</li> <li>2. Press the VOLUME ▲ or ▼ button to get the picture so the top of raster begins to lack.</li> <li>3. Press the VOLUME ▲ button to advance the data by 8 steps.</li> </ol> <p>Note : Check the vertical picture position is correct.</p>
WIDTH (WID)	<ol style="list-style-type: none"> <li>1. Call up the adjustment mode display, then select the item WID.</li> <li>2. Press the VOLUME ▲ or ▼ button to get the picture so the left and right edges of raster begins to lack.</li> <li>3. Press the VOLUME ▲ or ▼ button to advance the data by 7 steps.</li> </ol> <p>Note : Check the horizontal picture position is correct.</p>

ITEM	ADJUSTMENT PROCEDURE
VERTICAL LINEARITY (VLIN)	<ol style="list-style-type: none"> <li>1. Call up the adjustment mode display, then select the item <b>VLIN</b>.</li> <li>2. Press the TV/VIDEO button on Remote until the cross-hatch pattern appears on the screen.</li> <li>3. Press the VOLUME ▲ or ▼ button to obtain the picture of the best linearity.</li> <li>4. Then readjust the item HIT.</li> </ol> <div data-bbox="987 281 1409 537">  </div>
WHITE BALANCE (RCUT) (GCUT) (BCUT) (RDRV) (BDRV)	<ol style="list-style-type: none"> <li>1. Press RESET button on TV or remote hand set.</li> <li>2. Select Video 3 mode. (Don't put any signal in Video 3 jack.)</li> <li>3. Call up the adjustment mode display, then adjust the data of items <b>RCUT</b>, <b>GCUT</b> and <b>BCUT</b> to "40".</li> <li>4. Press TV (ANT)/VIDEO button on TV.</li> <li>5. Gradually rotate R, G and B SCREEN volume of FOCUS PAC (page 7) clockwise or counterclockwise until the raster appears slightly on the CRT through the each lens, and leave them. (Look into the lens in order to check the raster.)</li> <li>6. Press TV (ANT)/VIDEO button on TV again.</li> <li>7. Exit from service mode, and adjust the contrast to the minimum and brightness to the maximum.</li> <li>8. Call up the adjustment mode and press the TV (ANT)/VIDEO button on Remote until the Black &amp; White pattern appears on the screen.</li> <li>9. Adjust the data of items <b>RCUT</b>, <b>GCUT</b> and <b>BCUT</b> for low light area.</li> <li>10. Adjust the data of items <b>RDRV</b> and <b>BDRV</b> Controls for proper white-balanced picture in high light area.</li> <li>11. Check the white balance in both low and high light areas. If necessary, perform again steps from 7 to 9.</li> </ol> <div data-bbox="586 1176 821 1350">  </div> <div data-bbox="885 1213 1438 1350"> <p>High light area Adjust "RDRV" or "BDRV" to be white.</p> <p>Low light area Fine adjust "RCUT", "GCUT" or "BCUT" to be black.</p> </div>

# CONVERGENCE ADJUSTMENT

Adjust convergence from center to circumference in order.

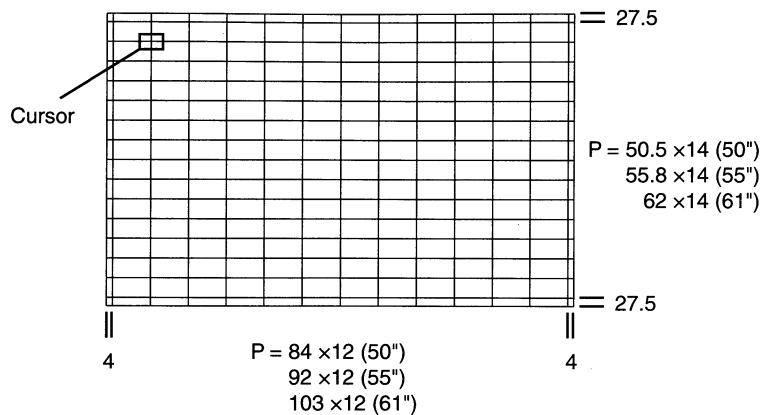
1. Select the adjustment mode following the steps on page 9.



## KEY FUNCTION IN THE CONVERGENCE ADJUSTMENT:

Up :	2 button
Selet Green color:	3 button
Left :	4 button
Blinking of cursor ON/OFF:	5 button
Right:	6 button
Adjust mode ON/OFF:	7 button
Down:	8 button
Erase Green line:	0 button
Erase Red line:	100 button
Erase Blue line:	CHRTN (ENT) button

2. Press "7" button to display the built-in cross-hatch pattern.



## Note:

Adjusting procedure in replacing convergence board.

1. User convergence center check. Make sure the best convergence setting is about the center of adjustable range.
2. CENTERING ADJUSTMENT
3. PICTURE POSITION ADJUSTMENT
4. HIT, WID ADJUSTMENT
5. CONVERGENCE ADJUSTMENT

The pattern includes three colors (R, G, B).

The cursor should be blinking in Red.

This means that the Red color is adjustable.

Adjustment around cursor can be done.

3. Press "3" button to select Green color to be adjusted.
4. Press "5" button to stop the blinking of cursor.
5. Press "2 (up)", "8 (down)", "4 (left)" or "6 (right)" to obtain the correct cross-hatch pattern as above.  
If necessary, the specified color line can be erased from the screen.  
100 button ..... to erase Red line  
0 button ..... to erase Green line  
RTN (ENT) button ..... to erase Blue line
6. Press "5" button to make the cursor blinking.
7. Press "2", "8", "4", "6" buttons to move the cursor to other point to be adjusted.
8. Repeat steps 4 to 7.
9. Repeat steps 3 to 8 to adjust Red and Blue colors.  
Converge the selected color line into the Green line.
10. Press "7" button to enter the adjusted states.  
At this time, picture changes for about 1 second.
11. Press "7" button again to return to the normal picture.

**NOTES**

In many cases, color misconvergence may be corrected by returning HIT and WID data in main deflection side to initial adjusting values. Following cases will surely require readjustment of convergence.

**CRT REPLACEMENT**

When CRT is replaced, main deflection readjustment and color matching are required.

Perform following procedures.

1. Replace two CRT's of blue and red.
2. Perform horizontal adjustment for blue and red yokes on base of green CRT data. Mount yoke and velocity mod. coil alignment, pushing towards CRT without gap.
3. Adjust alignment of blue and red. (Refer Alignment adjustment for details.)
4. Rotating centering magnet, adjust CRT centers of red and blue to CRT center of green.  
(Picture position adjustment)
5. Adjust HIT and WID data of main deflection, and decide data at the most precise screen comparing to green data.
6. Adjust convergence of each screen picture for color matching. Do not move green one at this time.
7. After convergence adjustment of each screen picture finishes, replace green CRT.  
For green CRT as well, repeat steps 2 to 5 above on bases of red and blue color matching to adjust convergence.

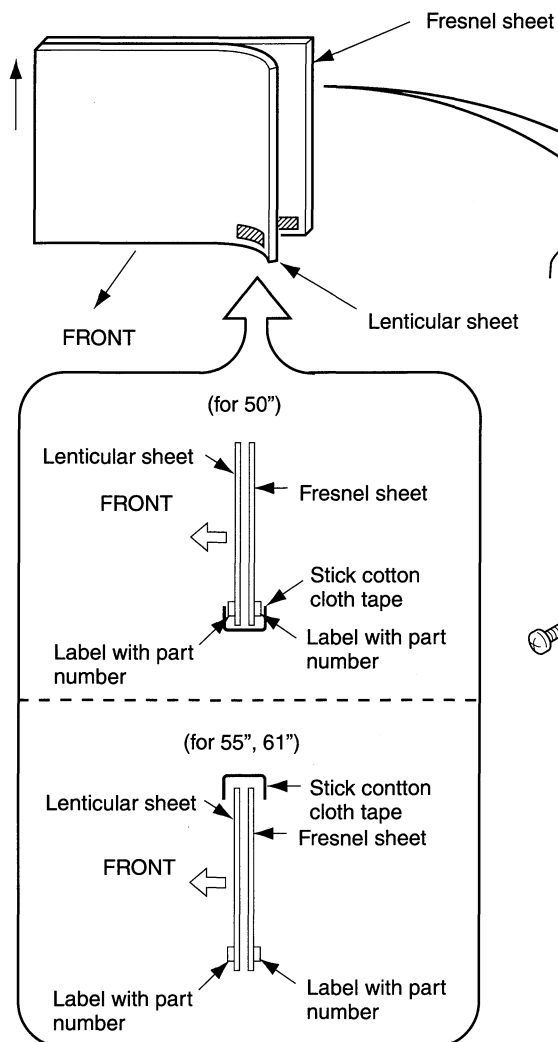
**REPLACING CONVERGENCE UNIT**

When replacing convergence unit, all picture screens require readjustment basically, but the following method allows process be reduced considerably.

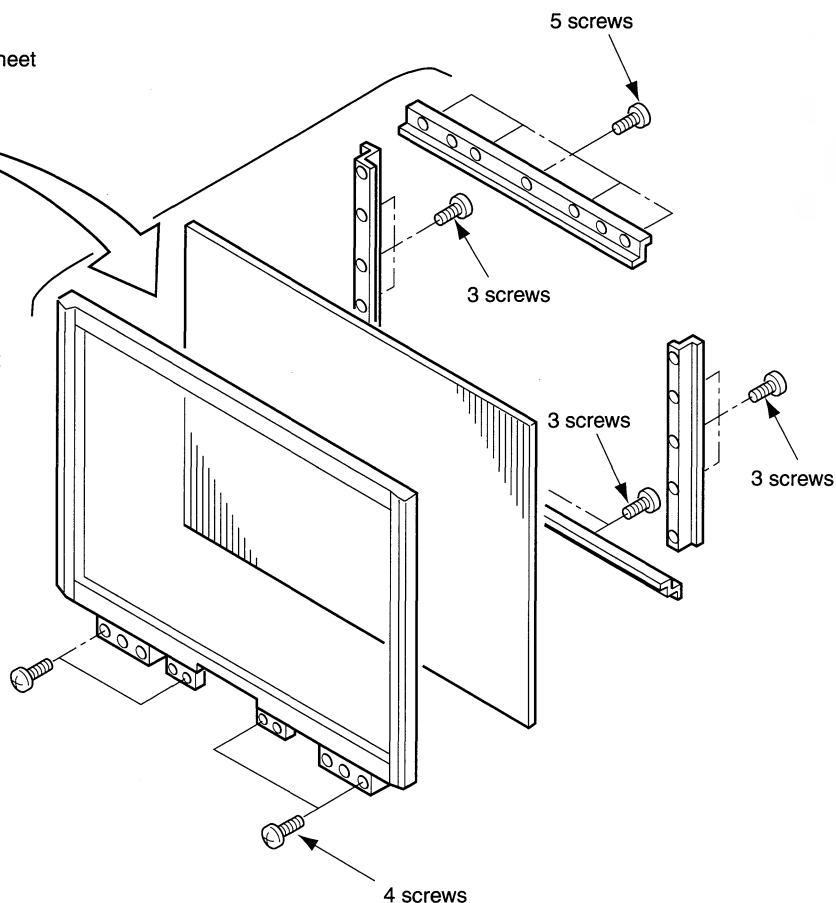
1. Replace the memory (Q713) on defective unit with memory on new unit. Mounting the unit on the SET after the above working realizes picture screen before replacement immediately.
2. Mount unit which has combination of old and new memories, on SET and turn it on. Screen shows whole picture looks like straightly shifted towards vertical or horizontal direction.
3. Adjust again centers of green, red and blue with centering magnets.
4. Check each picture screen for slight disparity of color and picture size. If necessary, add some adjustments of main deflection and color matching of convergence.

## SCREEN AND MIRROR ALIGNMENTS

### ASSEMBLING OF FRONT SCREEN



### MOUNTING OF FRONT SCREEN



\* Please refer to Mechanical Disassembly on page 25.

**CAUTION :** Do not hold the optical system parts (lens and mirror) with bare hand to avoid finger-prints on the surface of those parts.

### HOW TO CLEAN LENS AND MIRROR

1. Be sure to remove sand dust with an air brush, etc.
  2. When it is stained slightly, breathe upon it and wipe away with the specified cleaning cloth.
- For other stains than the above, wipe the stains away with the specified cloth into which a cleaning liquid has been soaked.

Cleaning liquid..... **LENS LUSTER** (Manufactured by Edmund Scientific Co.), etc.

### HOW TO CLEAN SCREEN

When cleaning the screen, use a soft cloth so as not to damage the screen.

1. Wipe the screen with a dry cloth to remove moisture on the screen.

**Note :** Absolutely do not use detergent, water, alcohol, benzine, thinner, etc. for cleaning in order not to wipe away the black print on the surface.

## CIRCUIT CHECKS

### HIGH VOLTAGE CHECK

**CAUTION:** There is no HIGH VOLTAGE ADJUSTMENT on this chassis. Checking should be done following the steps below.

1. Connect an accurate high voltage meter to the anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST to minimum (zero beam current).
3. High voltage must be measured below (B) kV.

Refer to table-1 for high voltage (B).

(See SETTING & ADJUSTING DATA on page 19)

4. Vary the BRIGHTNESS to both extremes to be sure the high voltage does not exceed the limit under any conditions.

### CAUTION:

When the following parts fail, check the High Voltage after replacing.

Location No.	Name	Name
T461	Flyback Trans.	TFB3078ZD
D489	Zener Diode	MTZJ3.6B
Q480	Transistor	2SC2023
Q483	IC	TA7508P(J)
R435	Resistor	33k ohm, $\pm 5\%$
R489	Resistor	3.3k ohm, $\pm 5\%$
R490	Resistor	3.3k ohm, $\pm 5\%$
R450	VR	1k ohm
C440	Capacitor	1000pF, $\pm 3\%$
C443	Capacitor	6800pF, $\pm 3\%$
C444	Capacitor	5100pF, $\pm 3\%$

### ANODE VOLTAGE MEASURING METHOD

**CAUTION:** Take extra precaution when measuring this high voltage. High voltages are also present in surrounding circuit boards (CRT DRIVE assembly, DEFLECTION assembly, and POWER SUPPLY assembly).

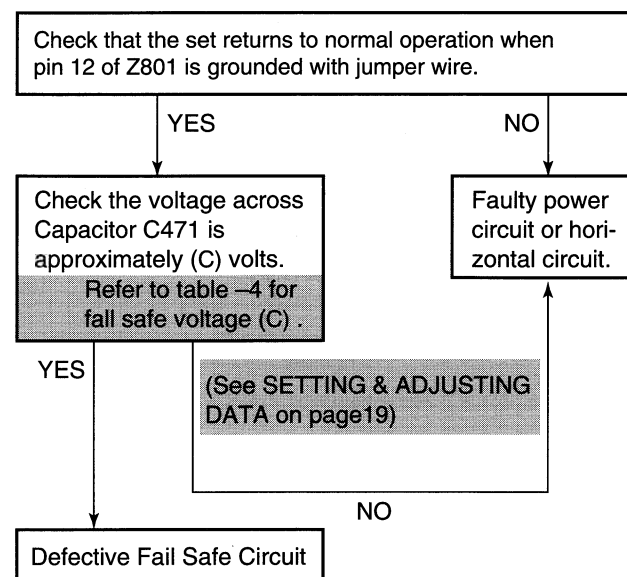
1. Disconnect the FBT anode cable as outlined below. Measure high voltage at the point where the cable enters the FBT.
2. Holding the rubber cover firmly, turn it counterclockwise and check that the lock has been disengaged. (See Fig. b on page 8.)
3. Determine the extent of the rubber cover before disconnecting the cable.
4. Pull straight up the anode cable to disconnect.
5. When reconnecting the cable, proceed in the reverse order. After reconnecting, tug on the cable to check that it is secure.

### FS CIRCUIT CHECK

The Fail Safe (FS) circuit check is indispensable for the final check in servicing. Checking should be done following the steps below.

1. Turn the receiver on.
2. Temporarily short TP- (R) and TP- (X) on the MAIN Board with a jumper wire.  
Raster and sound will disappear.
3. The receiver must remain in this state even after removing the jumper wire. This is the evidence that the FS circuit is functioning properly.
4. To obtain a picture again, temporarily turn the receiver off and allow the FS circuit more than 5 seconds to reset. Then turn the receiver on to produce a normal picture.

### Troubleshooting Guide for Fail Safe Circuit



## CHAPTER 2 SPECIFIC INFORMATION

### SETTING & ADJUSTING DATA

#### 【SAFETY INSTRUCTIONS】

		50"
HIGH VOLTAGE AT ZERO BEAM:	(A)	30.7 kV
MAX HIGH VOLTAGE:	(B)	32.5 kV

Table-1

#### 【SERVICE MODE】

##### ADJUSTING ITEMS AND DATA IN THE SERVICE MODE:

Item	Name of adjustment	Preset	50V61	50V51	Item	Name of adjustment	Preset	50V61	50V51
RCUT	R CUTOFF	40H	←	←	PARA	E-W PARABOLA (DPC)	05H	←	←
GCUT	G CUTOFF	40H	←	←	CNR	E-W CORNER	00H	←	←
BCUT	B CUTOFF	40H	←	←	TRAP	TRAPEZIUM	0BH	←	←
GDRV	G DRIVE	40H	←	←	PCOL	PIP COLOR	19H	←	←
BDRV	B DRIVE	40H	←	←	PHUE	PIP TINT	40H	←	←
SCNT	SUB-CONTRAST	10H	←	←	PCNT	PIP CONT	12H	←	←
BRTC	SUB-BRIGHT	80H	←	←	PYOF	PIP Y OFFSET	07H	←	←
COLC	SUB-COLOR	50H	←	←	PIOF	PIP I OFFSET	1DH	←	←
TNTC	SUB-TINT	44H	←	←	PQOF	PIP Q OFFSET	1DH	←	←
CNTX	SUB CONT MAX	7FH	←	←	GMPS	GMPS	00H	←	←
SCOL	SUB COLOR	05H	←	←	VPS	V-SHIFT	15H	←	←
HPOS	HORIZ. POSITION	11H	←	←	VCP	V-COMPENSATE	02H	←	←
VPOS	VERT. POSITION	04H	←	←	HCP	H-COMPENSATE	02H	←	←
HIT	HEIGHT	4DH	←	←	VFC	V-F CORRECT	0FH	←	←
LIN	V-LINEARITY	12H	←	←	DRHP	PIP 1/9H START	00H	←	←
VSC	V-S CORRECTION	08H	←	←	DRVP	PIP 1/16H START	00H	←	←
WID	PICTURE WIDTH	25H	23H	←					

Table-2

#### 【DESIGN MODE】

##### ADJUSTING ITEMS AND DATA IN THE DESIGN MODE:

Item	Name of adjustment	Preset Data	Data		Remarks
			50V61	50V51	
OPT0	OPTION 0	00H (18H)	00H	18H	
OPT1	OPTION 1	00H (01H)	00H	01H	

Table-3

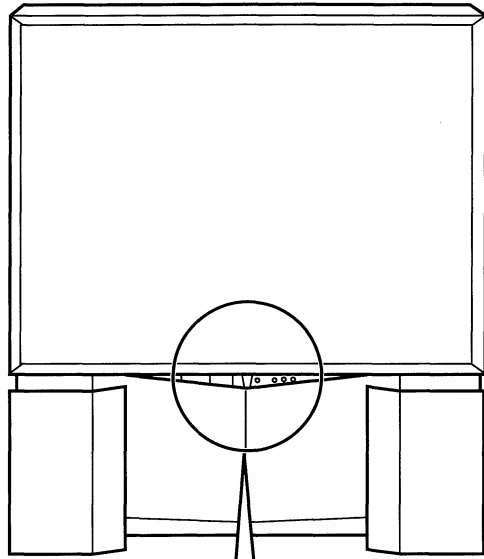
#### 【CIRCUIT CHECKS】

FBT DETECTION VOLTAGE	(C)	21.8V
-----------------------	-----	-------

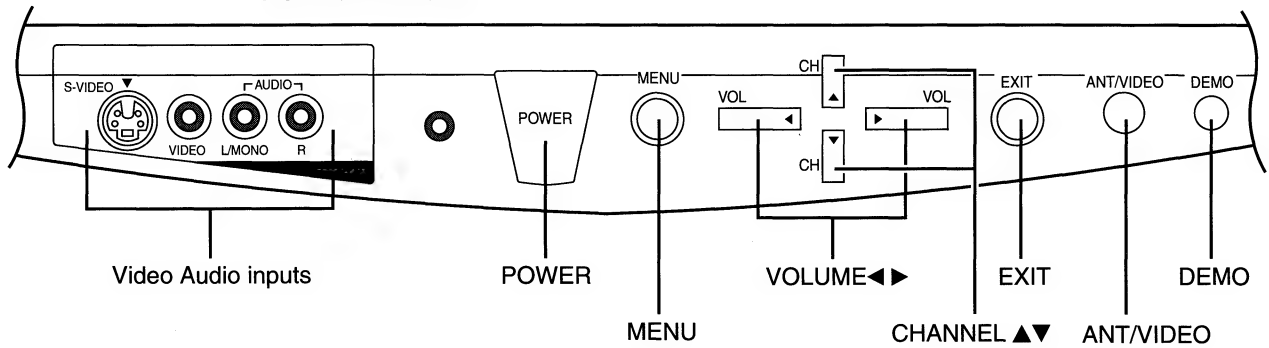
Table-4

## LOCATION OF CONTROLS (Representative : TZ50V61)

TV front

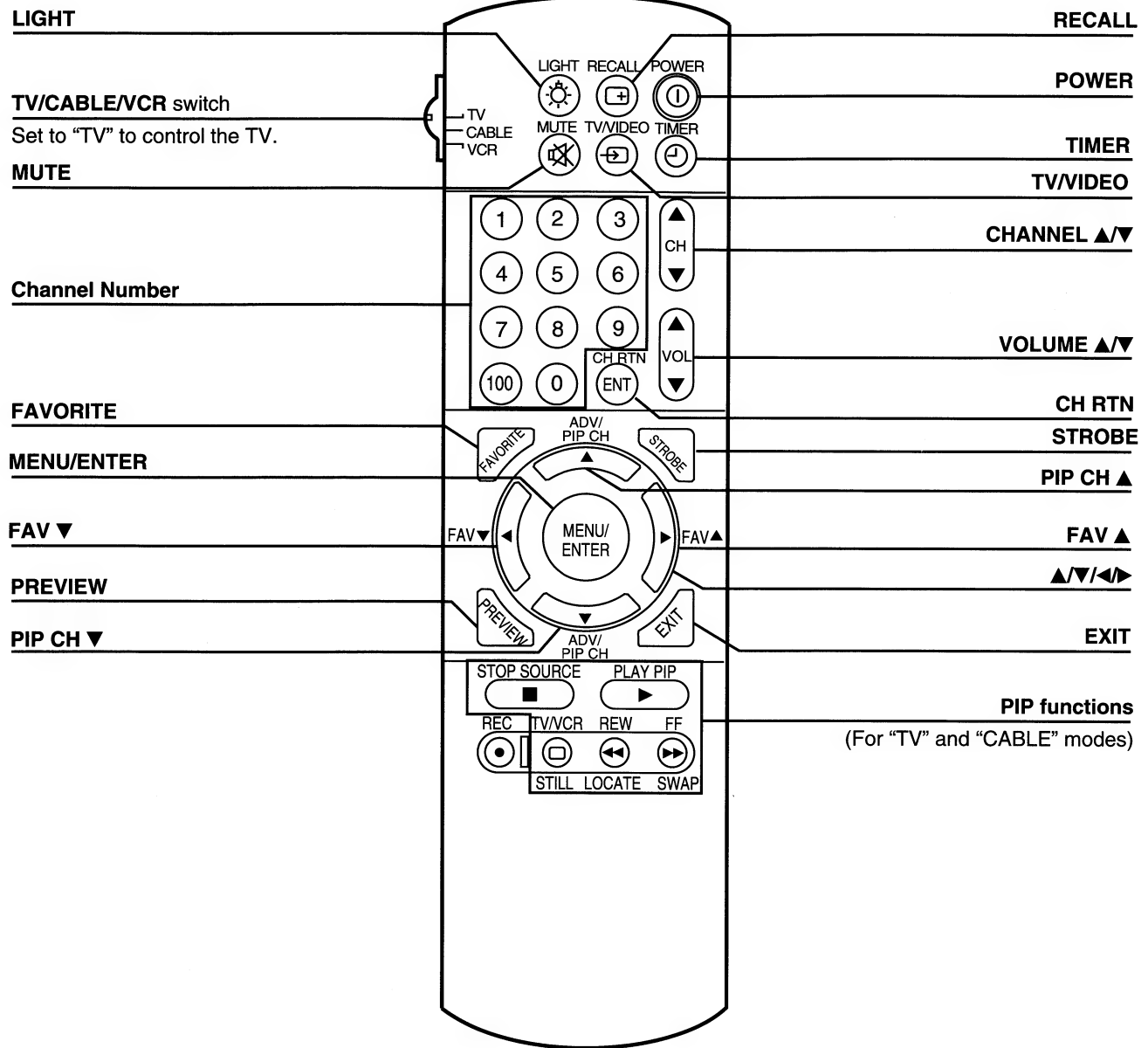


Behind the door





## Remote Control



## PROGRAMMING CHANNEL MEMORY

The channel memory is the list of TV channel numbers the TV tunes in when you press the CHANNEL ▲ or ▼ button.

**First, use the TV/CABLE and CH PROGRAM functions to preset all active channels in your area automatically.**

If necessary, arrange the preset channels with the ADD/ERASE functions so that you can tune into only desired channels.

**Note:** If you utilize both ANT-1 and ANT-2 terminals for some model, perform programming channels for each input source.

### TV/CABLE function

- 1** Press **MENU**, then press ► or ◀ until the SET UP menu appears.
- 2** Press ▼ (or ▲) until "TV/CABLE" is highlighted.
- 3** Press ► or ◀ to highlight either "TV" or "CABLE", whichever you use.

### CH PROGRAM function

- 1** Select "CH PROGRAM" following steps 1 and 2 above.
- 2** Press ► or ◀ to start channel programming.  
The TV will automatically cycle through all the TV or CABLE channels selected by the TV/CABLE function, and store active channels in the channel memory.
- 3** When channel programming is complete, you will see the message to the right appears.
- 4** Press **CHANNEL ▲** or **▼** to make sure the channel programming has been done properly.

### ADD/ERASE function

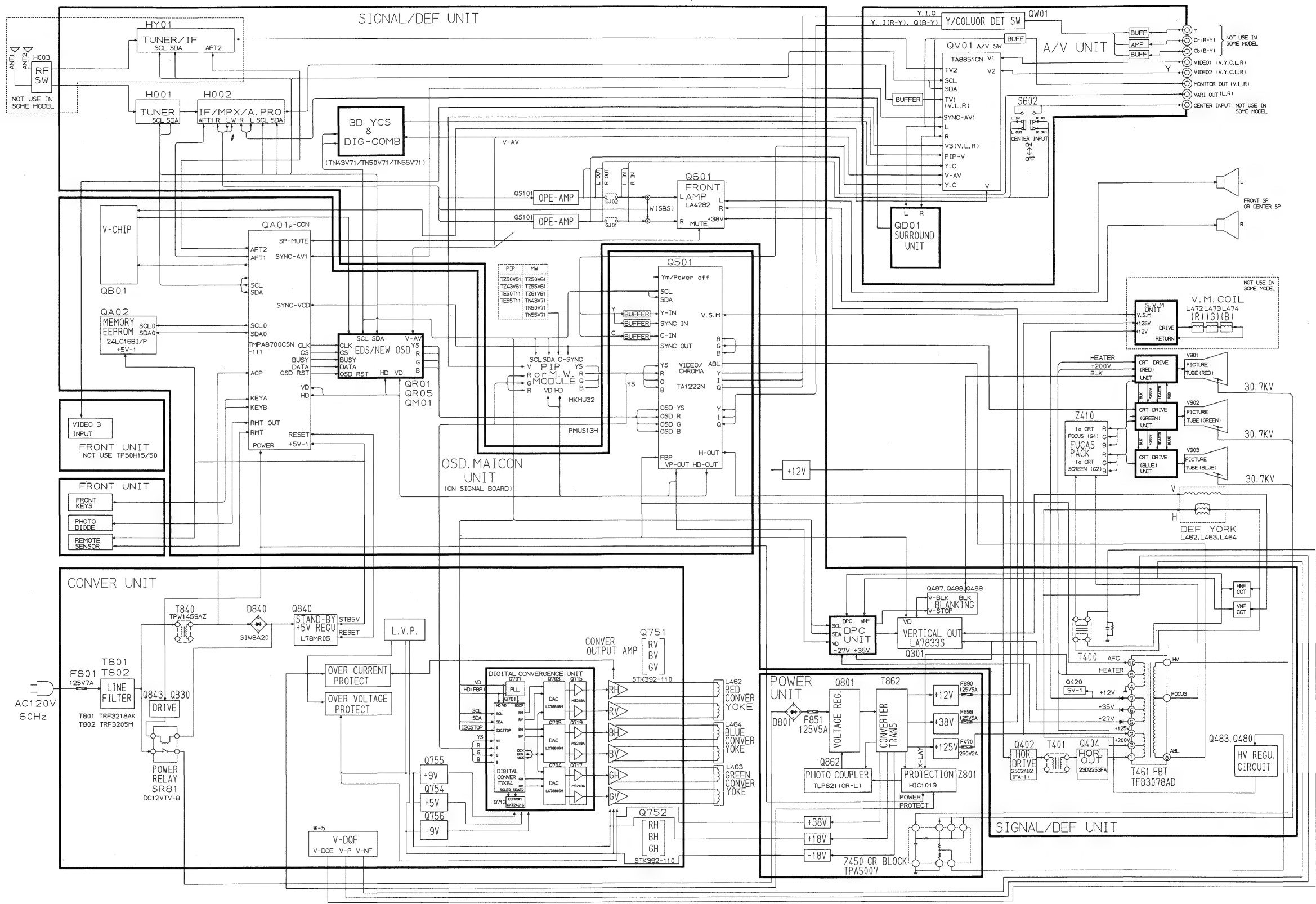
After performing the CH PROGRAM function, you can add or erase specific channels.

- 1** Select the channel you want to erase using the **CHANNEL ▲** or **▼** button, or select the channel you want to add using the **Channel Number** buttons.
- 2** Press **MENU**, then press ► or ◀ until the SET UP menu appears.
- 3** Press ▼ (or ▲) until "ADD/ERASE" is highlighted.
- 4** Press ► or ◀ :  
**To erase the channel** press the button until "ERASE" is highlighted.  
**To add the channel** press the button until "ADD" is highlighted.
- 5** Repeat steps 1 to 4 for other channels.

You have now completed the channel programming.

**Note:** The CHANNEL ▼/▲ buttons on the TV function as the ▼/▲ buttons while a menu is on the screen.

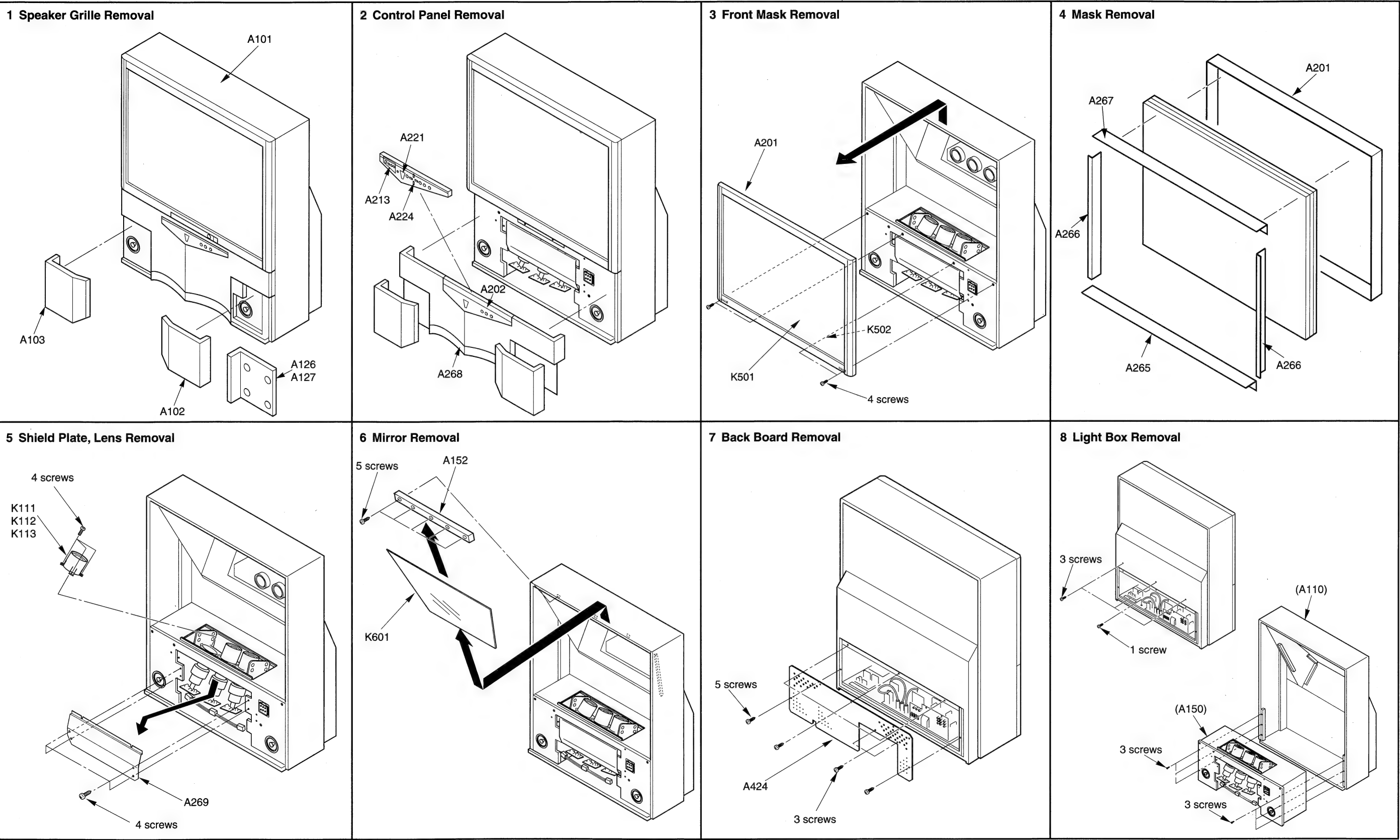
CIRCUIT BLOCK DIAGRAM



\* GJ01, GJ02 OPEN --OTHER \* -5 VERTICAL DYNAMIC FOCUS--NOT USE IN TZ50V61/TZ50V51  
SHORT --TZ50V51/TE50T11/TE55T11

TZ50V51  
BLOCK DIAGRAM TZ50V61  
PK2910

MECHANICAL DISASSEMBLY



# CHASSIS REPLACEMENT PARTS LIST

**WARNING:** BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 3 OF THIS MANUAL.

**CAUTION:** The international hazard symbols " $\Delta$ " in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE. Do not degrade the safety of the receiver through improper servicing.

**NOTICE:**

- The part number must be used when ordering parts, in order to assist in processing, be sure to include the Model number and Description.
- The PC board assembly with \* mark is no longer available after the end of the production.

**Models : TZ50V61/TZ50V51**

Capacitors ..... CD : Ceramic Disk      PF : Plastic Film      EL : Electrolytic  
Resistors ..... CF : Carbon Film      CC : Carbon Composition      MF : Metal Film  
                         OMF : Oxide Metal Film      VR : Variable Resistor      FR : Fusible Resistor  
(All CD and PF capacitors are  $\pm 5\%$ , 50V and all resistors,  $\pm 5\%$ , 1/6W unless otherwise noted.)

Location No.	Part No.	Description
<b>CAPACITORS</b>		
C101	24796339	EL, 3.3 $\mu$ F, $\pm 20\%$ , 35V
C104	24793331	EL, 330 $\mu$ F, 10V
C105	24474102	CD, 1000pF, $\pm 10\%$
C106	24797479	EL, 4.7 $\mu$ F, $\pm 20\%$ , 50V
C107	24763221	EL, 220 $\mu$ F, $\pm 20\%$ , 16V
C111	24763221	EL, 220 $\mu$ F, $\pm 20\%$ , 16V
C112	24474102	CD, 1000pF, $\pm 10\%$ (TZ50V61)
C113	24793101	EL, 100 $\mu$ F, $\pm 20\%$ , 10V (TZ50V61)
C114	24763221	EL, 220 $\mu$ F, $\pm 20\%$ , 16V (TZ50V61)
C201	24794100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
C203	24567104	PF, 0.1 $\mu$ F
C204	24797010	EL, 1 $\mu$ F, $\pm 20\%$ , 50V
C205	24206229	EL, 2.2 $\mu$ F, 50V
C206	24794100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
C207	24436390	CD, 39pF
C208	24436390	CD, 39pF
C209	24436390	CD, 39pF
C212	24794100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
C213	24567334	PF, 0.33 $\mu$ F
C303	24214471	CD, 470pF, $\pm 10\%$ , 500V
C305	24617912	EL, 2.2 $\mu$ F, $\pm 10\%$ , 50V
C306	24617858	EL, 3300 $\mu$ F, $\pm 20\%$ , 35V
C307	24693473	PF, 0.047 $\mu$ F, 100V
C308	24669221	EL, 220 $\mu$ F, $\pm 20\%$ , 50V
C309	24212101	CD, 100pF, $\pm 10\%$
C310	24669222	EL, 2200 $\mu$ F, $\pm 20\%$ , 50V
C311	24214561	CD, 560pF, $\pm 10\%$ , 500V
C313	24082057	PF, 0.22 $\mu$ F, 100V
C314	24591103	PF, 0.01 $\mu$ F
C315	24797229	EL, 2.2 $\mu$ F, $\pm 20\%$ , 50V
C315	24591103	PF, 0.01 $\mu$ F
C318	24666222	EL, 2200 $\mu$ F, $\pm 20\%$ , 16V
C319	24591102	PF, 1000pF
C320	24669101	EL, 100 $\mu$ F, $\pm 20\%$ , 50V
C321	24591183	PF, 0.018 $\mu$ F
C322	24617912	EL, 2.2 $\mu$ F, $\pm 10\%$ , 50V
C323	24591224	PF, 0.22 $\mu$ F
C326	24591683	PF, 0.068 $\mu$ F

Location No.	Part No.	Description
C340	24666100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
C344	24591102	PF, 1000pF
C350	24591104	PF, 0.1 $\mu$ F
C351	24666222	EL, 2200 $\mu$ F, $\pm 20\%$ , 16V
C352	24669229	EL, 2.2 $\mu$ F, $\pm 20\%$ , 50V
C357	24666100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
C370	24669101	EL, 100 $\mu$ F, $\pm 20\%$ , 50V
C371	24668100	EL, 10 $\mu$ F, $\pm 20\%$ , 35V
C401	24567104	PF, 0.1 $\mu$ F
C403	24591203	PF, 0.02 $\mu$ F
C403	24828823	PF, 0.082 $\mu$ F, 200V
C404	24797229	EL, 2.2 $\mu$ F, $\pm 20\%$ , 50V
C413	24214821	CD, 820pF, $\pm 10\%$ , 500V
C415	24591392	PF, 3900pF
C416	24678100	EL, 10 $\mu$ F, $\pm 20\%$ , 200V
C417	24214391	CD, 390pF, $\pm 10\%$ , 500V
$\Delta$ C418	24095883	PF, 0.015 $\mu$ F, $\pm 3\%$ , 630V
C419	24095803	PF, 0.062 $\mu$ F, 400V
C420	24666101	EL, 100 $\mu$ F, $\pm 20\%$ , 16V
$\Delta$ C423	24095779	PF, 0.62 $\mu$ F, 400V
C430	24232103	CD, 0.01 $\mu$ F, $\pm 80\%$ , -20%
C431	24794101	EL, 100 $\mu$ F, $\pm 20\%$ , 16V
C439	24669010	EL, 1 $\mu$ F, $\pm 20\%$ , 50V
$\Delta$ C440	24082323	PF, 1000pF, $\pm 3\%$ , 1500V
C443	24082348	PF, 6800pF, $\pm 3\%$ , 1500V
$\Delta$ C444	24082287	PF, 5100pF, $\pm 3\%$ , 1800V
C445	24828473	PF, 0.047 $\mu$ F, 200V
C446	24679330	EL, 33 $\mu$ F, $\pm 20\%$ , 250V
C447	24667102	EL, 1000 $\mu$ F, $\pm 20\%$ , 25V
C448	24640908	EL, 33 $\mu$ F, $\pm 20\%$ , 160V
C460	24669331	EL, 330 $\mu$ F, $\pm 20\%$
C463	24212152	CD, 1500pF, $\pm 10\%$
C464	24640872	EL, 10 $\mu$ F, $\pm 20\%$ , 100V
C465	24591332	PF, 3300pF
C466	24567394	PF, 0.39 $\mu$ F
$\Delta$ C467	24820153	PF, 0.15 $\mu$ F, 630V
C468	24567474	PF, 0.47 $\mu$ F
C470	24666220	EL, 22 $\mu$ F, $\pm 20\%$ , 16V
C471	24206479	EL, 4.7 $\mu$ F, 50V
C472	24567474	PF, 0.47 $\mu$ F
C473	24669229	EL, 2.2 $\mu$ F, $\pm 20\%$ , 50V

Location No.	Part No.	Description
C474	24666100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
C475	24820103	PF, 0.01 $\mu$ F, 630V
C481	24567104	PF, 0.1 $\mu$ F
C482	24591152	PF, 1500pF
C483	24567224	PF, 0.22 $\mu$ F
C484	24567104	PF, 0.1 $\mu$ F
C485	24669101	EL, 100 $\mu$ F, $\pm$ 20%, 50V
C493	24591124	PF, 0.12 $\mu$ F
C501	24232103	CD, 0.01 $\mu$ F, +80%, -20%
C502	24232103	CD, 0.01 $\mu$ F, +80%, -20%
C503	24763101	EL, 100 $\mu$ F, $\pm$ 20%, 16V
C504	24591222	PF, 2200pF
C505	24353120	CD, 12pF
C508	24794100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
C509	24763101	EL, 100 $\mu$ F, $\pm$ 20%, 16V
C510	24763101	EL, 100 $\mu$ F, $\pm$ 20%, 16V
C511	24232103	CD, 0.01 $\mu$ F, +80%, -20%
C512	24206228	EL, 0.22 $\mu$ F, 50V
C513	24232103	CD, 0.01 $\mu$ F, +80%, -20%
C514	24567104	PF, 0.1 $\mu$ F
C515	24567104	PF, 0.1 $\mu$ F
C517	24472010	CD, 1pF
C520	24763101	EL, 100 $\mu$ F, $\pm$ 20%, 16V
C601	24591102	PF, 1000pF
C602	24591102	PF, 1000pF
C603	24669100	EL, 10 $\mu$ F, $\pm$ 20%, 50V
C604	24669100	EL, 10 $\mu$ F, $\pm$ 20%, 50V
C605	24667101	EL, 100 $\mu$ F, $\pm$ 20%, 25V
C606	24795101	EL, 100 $\mu$ F, $\pm$ 20%, 25V
C607	24567104	PF, 0.1 $\mu$ F
C608	24567104	PF, 0.1 $\mu$ F
C609	24669102	EL, 1000 $\mu$ F, $\pm$ 20%, 50V
C610	24669102	EL, 1000 $\mu$ F, $\pm$ 20%, 50V
C611	24667221	EL, 220 $\mu$ F, $\pm$ 20%, 25V
C612	24794470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C664	24797479	EL, 4.7 $\mu$ F, $\pm$ 20%, 50V
C680	24669471	EL, 470 $\mu$ F, $\pm$ 20%, 50V
C681	24567104	PF, 0.1 $\mu$ F
C682	24567104	PF, 0.1 $\mu$ F
C690	24232103	CD, 0.01 $\mu$ F, +80%, -20%
C701	24781330	Chip, 33pF, SL
C702	24781330	Chip, 33pF, SL
C705	24781271	Chip, 270pF, SL
C711	24203100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
C714	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C715	24092441	Chip, 1 $\mu$ F, +80%, -20%, 16V
C716	24815822	Chip, 8200pF, $\pm$ 10%
C717	24774470	Chip, 47pF, CH
C718	24774470	Chip, 47pF, CH
C719	24794101	EL, 100 $\mu$ F, $\pm$ 20%, 16V
C720	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C721	24538104	PF, 0.1 $\mu$ F
C722	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C723	24774020	Chip, 2pF, $\pm$ 5%, 50V, CH
C724	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C725	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C726	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C727	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C728	24763221	EL, 220 $\mu$ F, $\pm$ 20%, 16V
C729	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C730	24538104	PF, 0.1 $\mu$ F
C731	24766010	EL, 1.0 $\mu$ F, $\pm$ 20%, 50V
C732	24590822	PF, 8200pF
C735	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V

Location No.	Part No.	Description
C736	24794470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C739	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C740	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C741	24794470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C742	24794470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C743	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C744	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C745	24794470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C746	24794470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C747	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C748	24092293	Chip, 0.1 $\mu$ F, +80%, -20%, 25V
C749	24794470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C750	24794470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C756	24781330	Chip, 33pF, SL
C761	24590182	PF, 1800pF
C762	24590562	PF, 5600pF
C763	24774391	Chip, 390pF
C765	24590182	PF, 1800pF
C766	24590562	PF, 5600pF
C767	24774391	Chip, 390pF
C769	24590182	PF, 1800pF
C770	24590562	PF, 5600pF
C771	24774391	Chip, 390pF
C773	24590182	PF, 1800pF
C774	24590562	PF, 5600pF
C775	24774391	Chip, 390pF
C777	24590182	PF, 1800pF
C778	24590562	PF, 5600pF
C779	24774391	Chip, 390pF
C781	24590182	PF, 1800pF
C782	24590562	PF, 5600pF
C783	24774391	Chip, 390pF
C795	24761221	EL, 220 $\mu$ F, $\pm$ 20%, 6.3V
C798	24763101	EL, 100 $\mu$ F, $\pm$ 20%, 16V
C799	24763101	EL, 100 $\mu$ F, $\pm$ 20%, 16V
C801	24082001	PF, 0.47 $\mu$ F, $\pm$ 20%, AC125V
C802	24082001	PF, 0.47 $\mu$ F, $\pm$ 20%, AC125V
C805	24092623	CD, 0.01 $\mu$ F, +80%, -20%, AC250V
C806	24092623	CD, 0.01 $\mu$ F, +80%, -20%, AC250V
C810	24086067	EL, 100 $\mu$ F, $\pm$ 20%, 200V
C811	24092597	CD, 4700pF, $\pm$ 20%, AC250V
C812	24092597	CD, 4700pF, $\pm$ 20%, AC250V
C813	24092597	CD, 4700pF, $\pm$ 20%, AC250V
C830	24539334	PF, 0.33 $\mu$ F
C831	24666470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C832	24539334	PF, 0.33 $\mu$ F
C833	24666470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C834	24539334	PF, 0.33 $\mu$ F (TZ50V61)
C835	24666101	EL, 100 $\mu$ F, $\pm$ 20%, 16V (TZ50V61)
C840	24667221	EL, 220 $\mu$ F, $\pm$ 20%, 25V
C842	24664101	EL, 100 $\mu$ F, $\pm$ 20%, 6.3V
C843	24567104	PF, 0.1 $\mu$ F
C850	24668102	EL, 1000 $\mu$ F, $\pm$ 20%, 35V
C851	24214471	CD, 470pF, $\pm$ 10%, 500V
C852	24214471	CD, 470pF, $\pm$ 10%, 500V
C853	24214471	CD, 470pF, $\pm$ 10%, 500V
C854	24214471	CD, 470pF, $\pm$ 10%, 500V
C855	24214471	CD, 470pF, $\pm$ 10%, 500V
C856	24214471	CD, 470pF, $\pm$ 10%, 500V
C857	24667332	EL, 3300 $\mu$ F, $\pm$ 20%, 25V
C858	24667332	EL, 3300 $\mu$ F, $\pm$ 20%, 25V

Location No.	Part No.	Description
C859	24669471	EL, 470μF, ±20%, 50V
C860	24214103	CD, 0.01μF, ±10%, 500V
C863	24567104	PF, 0.1μF
C864	24092484	CD, 1500pF, ±10%, 2kV
C865	24092482	CD, 1000pF, ±10%, 2kV
C866	24669010	EL, 1μF, ±20%, 50V
C867	24591682	PF, 6800pF
C868	24668470	EL, 47μF, ±20%, 35V
C869	24678229	EL, 2.2μF, ±20%, 200V
C870	24820124	PF, 0.12μF, 630V
C871	24092482	CD, 1000pF, ±10%, 2kV
C872	24435221	CD, 220pF, 500V
C873	24567224	PF, 0.22μF
C874	24435221	CD, 220pF, 500V
C876	24567104	PF, 0.1μF
C877	24092484	CD, 1500pF, ±10%, 2kV
C878	24820104	PF, 0.1μF, 630V
C879	24212101	CD, 100pF, ±10%
C880	24214471	CD, 470pF, ±10%, 500V
C881	24214471	CD, 470pF, ±10%, 500V
C882	24214471	CD, 470pF, ±10%, 500V
C883	24214471	CD, 470pF, ±10%, 500V
C884	24086916	EL, 330μF, ±20%, 160V
C885	24667332	EL, 3300μF, ±20%, 25V
C886	24214471	CD, 470pF, ±10%, 500V
C887	24214471	CD, 470pF, ±10%, 500V
C888	24214471	CD, 470pF, ±10%, 500V
C889	24214471	CD, 470pF, ±10%, 500V
C890	24669222	EL, 2200μF, ±20%, 50V
C891	24082229	PF, 0.1μF, ±10%, 250V
C892	24092338	CD, 270pF, ±10%, 2kV
C893	24092338	CD, 270pF, ±10%, 2kV
C894	24092338	CD, 270pF, ±10%, 2kV
C895	24092338	CD, 270pF, ±10%, 2kV
C898	24212102	CD, 1000pF, ±10%
C901	24211102	CD, 1000pF, ±10%, 2kV
C902	24794100	EL, 10μF, ±20%, 16V
C903	24232103	CD, 0.01μF, +80%, -20%
C904	24436102	CD, 1000pF
C908	24214472	CD, 4700pF, ±10%, 500V
C911	24211102	CD, 1000pF, ±10%, 2kV
C912	24794100	EL, 10μF, ±20%, 16V
C913	24232103	CD, 0.01μF, +80%, -20%
C914	24436102	CD, 1000pF
C915	24679330	EL, 33μF, ±20%, 250V
C916	24794101	EL, 100μF, ±20%, 16V
C918	24794470	EL, 47μF, ±20%, 16V
C921	24211102	CD, 1000pF, ±10%, 2kV
C922	24794100	EL, 10μF, ±20%, 16V
C923	24794470	EL, 47μF, ±20%, 16V
C924	24232103	CD, 0.01μF, +80%, -20%
C926	24436102	CD, 1000pF
C928	24214472	CD, 4700pF, ±10%, 500V
C929	24794100	EL, 10μF, ±20%, 16V
C941	24797478	EL, 0.47μF, ±20%, 50V
C943	24794102	EL, 1000μF, ±20%, 16V
C944	24203100	EL, 10μF, ±20%, 16V
C961	24666101	EL, 100μF, ±20%, 16V
C962	24203100	EL, 10μF, ±20%, 16V
C963	24232103	CD, 0.01μF, +80%, -20%
C964	24232103	CD, 0.01μF, +80%, -20%
C7701	24761221	EL, 220μF, ±20%, 6.3V
C7721	24212102	CD, 1000pF, ±10%
C7722	24436101	CD, 100pF

Location No.	Part No.	Description
C7724	24667101	EL, 100μF, ±20%, 25V
C7725	24667101	EL, 100μF, ±20%, 25V
C7726	24212102	CD, 1000pF, ±10%
C7727	24436101	CD, 100pF
C7729	24212102	CD, 1000pF, ±10%
C7730	24436101	CD, 100pF
C7732	24212102	CD, 1000pF, ±10%
C7733	24436101	CD, 100pF
C7735	24667101	EL, 100μF, ±20%, 25V
C7736	24669101	EL, 100μF, ±20%, 50V
C7737	24212102	CD, 1000pF, ±10%
C7738	24436101	CD, 100pF
C7740	24212102	CD, 1000pF, ±10%
C7741	24436101	CD, 100pF
C7744	24232103	CD, 0.01μF, +80%, -20%
C7747	24667101	EL, 100μF, ±20%, 25V
C7748	24567104	PF, 0.1μF
C7749	24567104	PF, 0.1μF
C7750	24667101	EL, 100μF, ±20%, 25V
C7751	24667101	EL, 100μF, ±20%, 25V
C7752	24567104	PF, 0.1μF
C7753	24567104	PF, 0.1μF
C7754	24667101	EL, 100μF, ±20%, 25V
C7755	24667101	EL, 100μF, ±20%, 25V
C7756	24567104	PF, 0.1μF
C7757	24567104	PF, 0.1μF
C7758	24667101	EL, 100μF, ±20%, 25V
C7760	24667470	EL, 47μF, ±20%, 25V
C7761	24667470	EL, 47μF, ±20%, 25V
C7762	24669100	EL, 10μF, ±20%, 50V
C7763	24667470	EL, 47μF, ±20%, 25V
C7764	24598331	PF, 330pF
C7765	24669479	EL, 4.7μF, ±20%, 50V
C7766	24669479	EL, 4.7μF, ±20%, 50V
C7767	24667470	EL, 47μF, ±20%, 25V
C7768	24567104	PF, 0.1μF
C7769	24232103	CD, 0.01μF, +80%, -20%
C7770	24669470	EL, 47μF, ±20%, 50V
C7771	24567103	PF, 0.01μF
C7772	24667101	EL, 100μF, ±20%, 25V
C7773	24669101	EL, 100μF, ±20%, 50V
C7774	24436331	CD, 330pF
C7775	24667101	EL, 100μF, ±20%, 25V
C7776	24667470	EL, 47μF, ±20%, 25V
C7777	24669470	EL, 47μF, ±20%, 50V
C7778	24567104	PF, 0.1μF
CA13	24474221	CD, 220pF, ±10%
CA22	24474101	CD, 100pF, ±10%
CA23	24474101	CD, 100pF, ±10%
CA24	24474101	CD, 100pF, ±10%
CA25	24474101	CD, 100pF, ±10%
CA33	24232103	CD, 0.01μF, +80%, -20%
CA36	24474101	CD, 100pF, ±10%
CA37	24474101	CD, 100pF, ±10%
CA38	24474101	CD, 100pF, ±10%
CA40	24567104	PF, 0.1μF
CA41	24567104	PF, 0.1μF
CA42	24666100	EL, 10μF, ±20%, 16V
CA43	24232103	CD, 0.01μF, +80%, -20%
CA44	24232103	CD, 0.01μF, +80%, -20%
CA68	24794100	EL, 10μF, ±20%, 16V
CA69	24232103	CD, 0.01μF, +80%, -20%
CB10	24085970	EL, 10μF, ±20%, 16V, Non-Polar

Location No.	Part No.	Description
CB11	24474101	CD, 100pF, $\pm 10\%$
CB11	24794470	EL, 47 $\mu$ F, $\pm 20\%$ , 16V
CB12	24794100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CB13	24085970	EL, 10 $\mu$ F, $\pm 20\%$ , 16V, Non-Polar
CB14	24474101	CD, 100pF, $\pm 10\%$
CB15	24794100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CB22	24474101	CD, 100pF, $\pm 10\%$
CB23	24474101	CD, 100pF, $\pm 10\%$
CB24	24474101	CD, 100pF, $\pm 10\%$
CB25	24474101	CD, 100pF, $\pm 10\%$
CB33	24212103	CD, 0.01 $\mu$ F, $\pm 10\%$
CB40	24567104	PF, 0.1 $\mu$ F
CB41	24567104	PF, 0.1 $\mu$ F
CB42	24794100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CB42	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CB43	24212103	CD, 0.01 $\mu$ F, $\pm 10\%$
CB44	24212103	CD, 0.01 $\mu$ F, $\pm 10\%$
CB90	24567103	PF, 0.01 $\mu$ F
CB91	24794100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CD02	24591562	PF, 5600pF
CD03	24591393	PF, 0.039 $\mu$ F
CD04	24591393	PF, 0.039 $\mu$ F
CD08	24794100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CD10	24436101	CD, 100pF
CD12	24436101	CD, 100pF
CD13	24797479	EL, 4.7 $\mu$ F, $\pm 20\%$ , 50V
CD14	24797229	EL, 2.2 $\mu$ F, $\pm 20\%$ , 50V
CD15	24794470	EL, 47 $\mu$ F, $\pm 20\%$ , 16V
CD16	24797229	EL, 2.2 $\mu$ F, $\pm 20\%$ , 50V
CR01	24797010	EL, 1 $\mu$ F, $\pm 20\%$ , 50V
CR02	24212103	CD, 0.01 $\mu$ F, $\pm 10\%$
CR03	24436101	CD, 100pF
CR09	24567104	PF, 0.1 $\mu$ F
CR10	24794470	EL, 47 $\mu$ F, $\pm 20\%$ , 16V
CR11	24567104	PF, 0.1 $\mu$ F
CR12	24567104	PF, 0.1 $\mu$ F
CR13	24567104	PF, 0.1 $\mu$ F
CR14	24567104	PF, 0.1 $\mu$ F
CR15	24567104	PF, 0.1 $\mu$ F
CR16	24567104	PF, 0.1 $\mu$ F
CR17	24567104	PF, 0.1 $\mu$ F
CR18	24567104	PF, 0.1 $\mu$ F
CR19	24567104	PF, 0.1 $\mu$ F
CR20	24567104	PF, 0.1 $\mu$ F
CR21	24567103	PF, 0.01 $\mu$ F
CS03	24436221	CD, 220pF
CS04	24206010	EL, 1 $\mu$ F, 50V
CS07	24436221	CD, 220pF
CS08	24206010	EL, 1 $\mu$ F, 50V
CS09	24436331	CD, 330pF
CS10	24206229	EL, 2.2 $\mu$ F, 50V
CS15	24436331	CD, 330pF
CS16	24206229	EL, 2.2 $\mu$ F, 50V
CS21	24436101	CD, 100pF
CS22	24436101	CD, 100pF
CS23	24206478	EL, 0.47 $\mu$ F, 50V
CS24	24436331	CD, 330pF
CS25	24206229	EL, 2.2 $\mu$ F, 50V
CS28	24436331	CD, 330pF
CS29	24436331	CD, 330pF
CS32	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CS33	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CS34	24436331	CD, 330pF

Location No.	Part No.	Description
CS35	24206229	EL, 2.2 $\mu$ F, 50V
CS36	24206229	EL, 2.2 $\mu$ F, 50V
CS38	24206229	EL, 2.2 $\mu$ F, 50V
CS41	24436331	CD, 330pF
CS42	24206229	EL, 2.2 $\mu$ F, 50V
CS43	24436331	CD, 330pF
CS44	24206229	EL, 2.2 $\mu$ F, 50V
CS115	24206010	EL, 1 $\mu$ F, 50V
CS116	24206010	EL, 1 $\mu$ F, 50V
CS117	24747478	EL, 0.47 $\mu$ F, $\pm 20\%$ , 50V
CS119	24206010	EL, 1 $\mu$ F, 50V
CS120	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CS121	24206010	EL, 1 $\mu$ F, 50V
CV01	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CV02	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CV03	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CV04	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CV05	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CV08	24666471	EL, 470 $\mu$ F, $\pm 20\%$ , 16V
CV09	24666471	EL, 470 $\mu$ F, $\pm 20\%$ , 16V
CV13	24794100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CV14	24232103	CD, 0.01 $\mu$ F, +80%, -20% (TZ50V61)
CV15	24232103	CD, 0.01 $\mu$ F, +80%, -20% (TZ50V61)
CV16	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CV17	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CV19	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CV21	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CV22	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CV23	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CV24	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CV27	24202221	EL, 220 $\mu$ F, $\pm 20\%$ , 10V
CV28	24202221	EL, 220 $\mu$ F, $\pm 20\%$ , 10V
CV29	24203101	EL, 100 $\mu$ F, $\pm 20\%$ , 16V
CV30	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CV31	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V (TZ50V61)
CV38	24203101	EL, 100 $\mu$ F, $\pm 20\%$ , 16V
CV39	24212102	CD, 1000pF, $\pm 10\%$
CV40	24763101	EL, 100 $\mu$ F, $\pm 20\%$ , 16V
CV41	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CV42	24203330	EL, 33 $\mu$ F, $\pm 20\%$ , 16V
CV44	24436470	CD, 47pF
CV45	24436220	CD, 22pF
CV46	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CV48	24763101	EL, 100 $\mu$ F, $\pm 20\%$ , 16V
CV49	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CV61	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CV64	24206100	EL, 10 $\mu$ F, 50V
CV65	24591122	PF, 1200pF
CV66	24436561	CD, 560pF
CV67	24591102	PF, 1000pF
CV68	24206010	EL, 1 $\mu$ F, 50V
CW02	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CW03	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CW04	24591822	PF, 8200pF
CW04	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CW05	24212103	CD, 0.01 $\mu$ F, $\pm 10\%$
CW07	24666470	EL, 47 $\mu$ F, $\pm 20\%$ , 16V
CW07	24203100	EL, 10 $\mu$ F, $\pm 20\%$ , 16V
CW08	24794101	EL, 100 $\mu$ F, $\pm 20\%$ , 16V
CW08	24794101	EL, 100 $\mu$ F, $\pm 20\%$ , 16V
CW09	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CW09	24232103	CD, 0.01 $\mu$ F, +80%, -20%



Location No.	Part No.	Description
CW12	24666470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
CW13	24790100	EL, 10 $\mu$ F, $\pm$ 20%, 160V
CW14	24436101	CD, 100pF
CW15	24214472	CD, 4700pF, $\pm$ 10%, 500V
CW16	24436101	CD, 100pF
CW17	24214472	CD, 4700pF, $\pm$ 10%, 500V
CW18	24666470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
CW19	24435560	CD, 56pF, 500V
CW20	24790100	EL, 10 $\mu$ F, $\pm$ 20%, 160V
CW21	24666470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
CW22	24436561	CD, 560pF
CW26	24212102	CD, 1000pF, $\pm$ 10%
CY01	24793471	EL, 470 $\mu$ F, $\pm$ 20%, 10V
CY40	24206100	EL, 10 $\mu$ F, 50V
CZ01	24797478	EL, 0.47 $\mu$ F, $\pm$ 20%, 50V
CZ02	24794101	EL, 100 $\mu$ F, $\pm$ 20%, 16V
CZ03	24092398	CD, 0.1 $\mu$ F, +80%, -20%
CZ04	24476103	CD, 0.01 $\mu$ F, $\pm$ 30%, 16V
CZ05	24476103	CD, 0.01 $\mu$ F, $\pm$ 30%, 16V
CZ06	24476103	CD, 0.01 $\mu$ F, $\pm$ 30%, 16V
CZ07	24794101	EL, 100 $\mu$ F, $\pm$ 20%, 16V
CZ09	24567103	PF, 0.01 $\mu$ F
CZ11	24567103	PF, 0.01 $\mu$ F
CZ12	24474181	CD, 180pF, $\pm$ 10%
CZ13	24476103	CD, 0.01 $\mu$ F, $\pm$ 30%, 16V
CZ14	24476103	CD, 0.01 $\mu$ F, $\pm$ 30%, 16V
CZ15	24473560	CD, 56pF
CZ16	24473470	CD, 47pF
CZ18	24092398	CD, 0.1 $\mu$ F, +80%, -20%
CZ19	24794330	EL, 33 $\mu$ F, $\pm$ 20%, 16V
CZ23	24092398	CD, 0.1 $\mu$ F, +80%, -20%
CZ27	24436080	CD, 8pF, $\pm$ 0.25pF
CZ28	24436390	CD, 39pF
CZ29	24436390	CD, 39pF
CZ30	24436220	CD, 22pF

## RESISTORS

R101	24382183	OMF, 18k ohm, 1W
R102	24366123	CF, 12k ohm
R151	24366562	CF, 5600 ohm (TZ50V61)
R152	24366103	CF, 10k ohm (TZ50V61)
R201	24366821	CF, 820 ohm
R202	24366122	CF, 1200 ohm
R204	24366104	CF, 100k ohm
R205	24366101	CF, 100 ohm (TZ50V61)
R206	24366102	CF, 1k ohm (TZ50V61)
R207	24366101	CF, 100 ohm
R208	24366101	CF, 100 ohm
R209	24366101	CF, 100 ohm
R212	24366472	CF, 4700 ohm
R213	24366122	CF, 1200 ohm
R214	24366222	CF, 2200 ohm
R216	24366103	CF, 10k ohm
R217	24366102	CF, 1k ohm
R218	24367103	CF, 10k ohm, $\pm$ 2%
R223	24366102	CF, 1k ohm
R227	24367912	CF, 9100 ohm, $\pm$ 2%
R240	24366272	CF, 2700 ohm
R241	24366272	CF, 2700 ohm
R242	24366102	CF, 1k ohm
R266	24366102	CF, 1k ohm
R267	24366821	CF, 820 ohm
R268	24366821	CF, 820 ohm
R269	24366102	CF, 1k ohm

Location No.	Part No.	Description
R270	24366682	CF, 6800 ohm
R301	24366102	CF, 1k ohm
R303	24321129	MF, 1.2 ohm, 1/2W
R304	24367223	CF, 22k ohm, $\pm$ 2%
R305	24322828	OMF, 0.82 ohm, 1W
R306	24367563	CF, 56k ohm, $\pm$ 2%
R307	24367224	CF, 220k ohm
R308	24382391	OMF, 390 ohm, 1W
R313	24367153	CF, 15k ohm, $\pm$ 2%
R313	24366104	CF, 100k ohm
R314	24366105	CF, 1M ohm
R315	24366824	CF, 820k ohm
R316	24366274	CF, 270k ohm
R318	24366471	CF, 470 ohm
R319	24366471	CF, 470 ohm
R320	24366101	CF, 100 ohm
R327	24000187	FR, 3.3 ohm, 1W
R329	24366153	CF, 15k ohm
R330	24366102	CF, 1k ohm
R334	24366102	CF, 1k ohm
R336	24382271	OMF, 270 ohm, 1W
R341	24366472	CF, 4700 ohm
R343	24366153	CF, 15k ohm
R346	24366102	CF, 1k ohm
R347	24366184	CF, 180k ohm
R350	24366222	CF, 2200 ohm
R351	24366823	CF, 82k ohm
R352	24366104	CF, 100k ohm
R353	24552101	OMF, 100 ohm, 1/2W
R354	24366682	CF, 6800 ohm
R356	24366823	CF, 82k ohm
R357	24366332	CF, 3300 ohm
R358	24366682	CF, 6800 ohm
R359	24366103	CF, 10k ohm
R370	24321159	MF, 1.5 ohm, 1/2W
R371	24366682	CF, 6800 ohm
R372	24366472	CF, 4700 ohm
R373	24366152	CF, 1500 ohm
R374	24366473	CF, 47k ohm
R375	24366102	CF, 1k ohm
R389	24366222	CF, 2200 ohm
R390	24382561	OMF, 560 ohm, 1W
R390	24366682	CF, 6800 ohm
R391	24382561	OMF, 560 ohm, 1W
R391	24366153	CF, 15k ohm
R392	24366822	CF, 8200 ohm
R392	24382561	OMF, 560 ohm, 1W
R400	24942102	CC, 1000pF, 1/2W
R401	24366391	CF, 390 ohm
R402	24366103	CF, 10k ohm
R403	24366302	CF, 3k ohm
R404	24383270	OMF, 27 ohm, 2W
R405	24382562	OMF, 5600 ohm, 1W
R406	24366223	CF, 22k ohm
R407	24366103	CF, 10k ohm
R408	24321209	MF, 2 ohm, 1/2W
R409	24552103	OMF, 10k ohm, 1/2W
R410	24366331	CF, 330 ohm
R411	24366471	CF, 470 ohm
R413	24366274	CF, 270k ohm
R415	24553272	OMF, 2700 ohm, 1W
R416	24510562	Cement, 5600 ohm, 5W
R422	24366472	CF, 4700 ohm
R423	24366472	CF, 4700 ohm

Location No.	Part No.	Description
R424	24546338	FR, 0.33 ohm, 1/2W
R425	24552331	OMF, 330 ohm, 1/2W
R426	24366152	CF, 1500 ohm
R427	24366822	CF, 8200 ohm
R428	24366561	CF, 560 ohm
R429	24552330	OMF, 33 ohm, 1/2W
R431	24382100	OMF, 10 ohm, 1W
R432	24383911	OMF, 910 ohm, 2W
R433	24366912	CF, 9100 ohm
R434	24366102	CF, 1k ohm
R435	24366333	CF, 33k ohm
R436	24327224	MF, 220k ohm, $\pm 1\%$ , 1/4W
R439	24366472	CF, 4700 ohm
R441	24383102	OMF, 1k ohm, 2W
R443	24310109	MF, 1.0 ohm, 1/2W
R444	24338398	MF, 0.39 ohm, 1W
R445	24382682	OMF, 6800 ohm, 1W
R446	24382682	OMF, 6800 ohm, 1W
R447	24382473	OMF, 47k ohm, 1W
R448	24338828	MF, 0.82 ohm, 1W
R450	24066879	VR, 1k ohm, 0.3W
R451	24376223	CF, 22k ohm, 1/2W
R452	24376223	CF, 22k ohm, 1/2W
R453	24376223	CF, 22k ohm, 1/2W
R454	24366223	CF, 22k ohm
R455	24367333	CF, 33k ohm, $\pm 2\%$
R460	24552332	OMF, 3300 ohm, 1/2W
R461	24366332	CF, 3300 ohm
R463	24339109	MF, 1 ohm, 2W
R464	24366273	CF, 27k ohm
R465	24366114	CF, 110k ohm
R466	24366152	CF, 1500 ohm
R469	24000465	FR, 9.1 ohm, 1W
R470	24338568	MF, 0.56 ohm, 1W
R471	24553271	OMF, 270 ohm, 1W
R472	24552270	OMF, 27 ohm, 1/2W
R473	24366102	CF, 1k ohm
R477	24383121	OMF, 120 ohm, 2W
R478	24376333	CF, 33k ohm, 1/2W
R479	24553121	OMF, 120 ohm, 1W
R480	24552272	OMF, 2700 ohm, 1/2W
R481	24366393	CF, 39k ohm
R482	24366103	CF, 10k ohm
R483	24366154	CF, 150k ohm
R484	24366473	CF, 47k ohm
R485	24552221	OMF, 220 ohm, 1/2W
R487	24366472	CF, 4700 ohm
R488	24366474	CF, 470k ohm
R489	24366332	CF, 3300 ohm
R490	24366332	CF, 3300 ohm
R491	24366912	CF, 9100 ohm
R491	24366472	CF, 4700 ohm
R492	24366102	CF, 1k ohm
R493	24552472	OMF, 4700 ohm, 1/2W
R494	24366183	CF, 18k ohm
R495	24366472	CF, 4700 ohm
R497	24552201	OMF, 200 ohm, 1/2W
R498	24366473	CF, 47k ohm
R499	24366681	CF, 680 ohm
R501	24366223	CF, 22k ohm
R502	24366101	CF, 100 ohm
R503	24366101	CF, 100 ohm
R504	24366101	CF, 100 ohm
R505	24366471	CF, 470 ohm

Location No.	Part No.	Description
R506	24366103	CF, 10k ohm
R508	24366102	CF, 1k ohm
R509	24366471	CF, 470 ohm
R510	24366102	CF, 1k ohm
R512	24366101	CF, 100 ohm
R514	24366122	CF, 1200 ohm
R515	24366103	CF, 10k ohm
R601	24366822	CF, 8200 ohm
R602	24366822	CF, 8200 ohm
R603	24366152	CF, 1500 ohm
R604	24366152	CF, 1500 ohm
R609	24366229	CF, 2.2 ohm
R610	24366229	CF, 2.2 ohm
R611	24366472	CF, 4700 ohm
R612	24366472	CF, 4700 ohm
R613	24366222	CF, 2200 ohm
R680	24366473	CF, 47k ohm
R682	24366473	CF, 47k ohm
R683	24366223	CF, 22k ohm
R684	24366223	CF, 22k ohm
R687	24366103	CF, 10k ohm
R689	24366222	CF, 2200 ohm
R690	24366823	CF, 82k ohm
R701	24872221	Chip, 220 ohm, 1/16W
R702	24872221	Chip, 220 ohm, 1/16W
R707	24872100	Chip, 10 ohm, 1/16W
R708	24872100	Chip, 10 ohm, 1/16W
R709	24872100	Chip, 10 ohm, 1/16W
R710	24872100	Chip, 10 ohm, 1/16W
R711	24872100	Chip, 10 ohm, 1/16W
R712	24872100	Chip, 10 ohm, 1/16W
R713	24872100	Chip, 10 ohm, 1/16W
R714	24872100	Chip, 10 ohm, 1/16W
R715	24872153	Chip, 15k ohm, 1/16W
R716	24872103	Chip, 10k ohm, 1/16W
R717	24872622	Chip, 6200 ohm, 1/16W
R718	24872152	Chip, 1500 ohm, 1/16W
R720	24872103	Chip, 10k ohm, 1/16W
R721	24872223	Chip, 22k ohm, 1/16W
R722	24872222	Chip, 2200 ohm, 1/16W
R725	24872754	Chip, 750k ohm, 1/16W
R727	24871221	Chip, 220 ohm, 1/8W
R728	24872393	Chip, 39k ohm, 1/16W
R729	24872153	Chip, 15k ohm, 1/16W
R735	24872911	Chip, 910 ohm, 1/16W
R736	24872911	Chip, 910 ohm, 1/16W
R737	24872152	Chip, 1500 ohm, 1/16W
R738	24872332	Chip, 3300 ohm, 1/16W
R739	24872362	Chip, 3600 ohm, 1/16W
R740	24872911	Chip, 910 ohm, 1/16W
R741	24872911	Chip, 910 ohm, 1/16W
R742	24872152	Chip, 1500 ohm, 1/16W
R743	24872332	Chip, 3300 ohm, 1/16W
R744	24872362	Chip, 3600 ohm, 1/16W
R745	24872911	Chip, 910 ohm, 1/16W
R746	24872911	Chip, 910 ohm, 1/16W
R747	24872152	Chip, 1500 ohm, 1/16W
R748	24872332	Chip, 3300 ohm, 1/16W
R749	24872362	Chip, 3600 ohm, 1/16W
R750	24872911	Chip, 910 ohm, 1/16W
R751	24872911	Chip, 910 ohm, 1/16W
R752	24872152	Chip, 1500 ohm, 1/16W
R753	24872332	Chip, 3300 ohm, 1/16W
R754	24872362	Chip, 3600 ohm, 1/16W

Location No.	Part No.	Description
R755	24872911	Chip, 910 ohm, 1/16W
R756	24872911	Chip, 910 ohm, 1/16W
R757	24872152	Chip, 1500 ohm, 1/16W
R758	24872332	Chip, 3300 ohm, 1/16W
R759	24872362	Chip, 3600 ohm, 1/16W
R760	24872911	Chip, 910 ohm, 1/16W
R761	24872911	Chip, 910 ohm, 1/16W
R762	24872152	Chip, 1500 ohm, 1/16W
R763	24872332	Chip, 3300 ohm, 1/16W
R764	24872362	Chip, 3600 ohm, 1/16W
R778	24872101	Chip, 100 ohm, 1/16W
R779	24872101	Chip, 100 ohm, 1/16W
R780	24872101	Chip, 100 ohm, 1/16W
R781	24872101	Chip, 100 ohm, 1/16W
R782	24872101	Chip, 100 ohm, 1/16W
R783	24872101	Chip, 100 ohm, 1/16W
R786	24872472	Chip, 4700 ohm, 1/16W
R787	24872472	Chip, 4700 ohm, 1/16W
R809	24007042	Cement, 2.2 ohm, 5W
R810	24007061	Cement, 1.8 ohm, $\pm 10\%$ , 2W
R830	24546189	FR, 1.8 ohm, 1/2W
R831	24366471	CF, 470 ohm
R846	24366103	CF, 10k ohm
R861	24382153	OMF, 15k ohm, 1W
R862	24381330	OMF, 33 ohm, 1/2W
R864	24552102	OMF, 1k ohm, 1/2W
R865	24552181	OMF, 180 ohm, 1/2W
R867	24000247	MF, 39k ohm, $\pm 1\%$ , 1/4W
R868	24552101	OMF, 100 ohm, 1/2W
R870	24381221	OMF, 220 ohm, 1/2W
R871	24382470	OMF, 47 ohm, 1W
R872	24382913	OMF, 91k ohm, 1W
R883	24381682	OMF, 6800 ohm, 1/2W
R884	24366102	CF, 1k ohm
R889	24366272	CF, 2700 ohm
R890	24382333	OMF, 33k ohm, 1W
R891	24366152	CF, 1500 ohm
R898	24002000	CC, 3.9M ohm, $\pm 10\%$ , 1/2W
R900	24000940	FR, 2 ohm, 2W
R901	24366101	CF, 100 ohm
R903	24942102	CC, 1000pF, 1/2W
R904	24366102	CF, 1k ohm
R905	24366910	CF, 91 ohm
R906	24366471	CF, 470 ohm
R908	24366430	CF, 43 ohm
R909	24366121	CF, 120 ohm
R911	24366101	CF, 100 ohm
R913	24942102	CC, 1000pF, 1/2W
R914	24366102	CF, 1k ohm
R915	24366820	CF, 82 ohm
R916	24366471	CF, 470 ohm
R918	24366430	CF, 43 ohm
R919	24366471	CF, 470 ohm
R921	24366101	CF, 100 ohm
R923	24942102	CC, 1000pF, 1/2W
R924	24366102	CF, 1k ohm
R925	24366121	CF, 120 ohm
R926	24366471	CF, 470 ohm
R928	24366430	CF, 43 ohm
R931	24555153	OMF, 15k ohm, 3W
R932	24555153	OMF, 15k ohm, 3W
R936	24366330	CF, 33 ohm
R940	24366331	CF, 330 ohm
R941	24555153	OMF, 15k ohm, 3W

Location No.	Part No.	Description
R942	24555153	OMF, 15k ohm, 3W
R943	24366103	CF, 10k ohm
R944	24366120	CF, 12 ohm
R945	24366680	CF, 68 ohm
R946	24366330	CF, 33 ohm
R947	24366561	CF, 560 ohm
R949	24366910	CF, 91 ohm
R950	24366101	CF, 100 ohm
R951	24555153	OMF, 15k ohm, 3W
R952	24555153	OMF, 15k ohm, 3W
R953	24366910	CF, 91 ohm
R954	24366102	CF, 1k ohm
R955	24366151	CF, 150 ohm
R956	24366271	CF, 270 ohm
R957	24366330	CF, 33 ohm
R958	24366821	CF, 820 ohm
R959	24366560	CF, 56 ohm
R960	24366560	CF, 56 ohm
R961	24366821	CF, 820 ohm
R962	24366391	CF, 390 ohm
R963	24366222	CF, 2200 ohm
R964	24366332	CF, 3300 ohm
R965	24366471	CF, 470 ohm
R966	24366821	CF, 820 ohm
R967	24366122	CF, 1200 ohm
R968	24366680	CF, 68 ohm
R969	24366103	CF, 10k ohm
R970	24366222	CF, 2200 ohm
R971	24367152	CF, 1500 ohm, $\pm 2\%$
R972	24367471	CF, 470 ohm, $\pm 2\%$
R973	24367681	CF, 680 ohm, $\pm 2\%$
R974	24367681	CF, 680 ohm, $\pm 2\%$
R975	24366242	CF, 2400 ohm
R976	24367562	CF, 5600 ohm, $\pm 2\%$
R977	24367682	CF, 560 ohm, $\pm 2\%$
R978	24367681	CF, 680 ohm, $\pm 2\%$
R980	24366272	CF, 2700 ohm
R981	24366103	CF, 10k ohm
R982	24366392	CF, 3900 ohm
R983	24366562	CF, 5600 ohm
R984	24366392	CF, 3900 ohm
R986	24366102	CF, 1k ohm
R987	24366822	CF, 8200 ohm
R988	24366103	CF, 10k ohm
R989	24366103	CF, 10k ohm
R990	24366271	CF, 270 ohm
R991	24366271	CF, 270 ohm
R992	24366272	CF, 2700 ohm
R993	24366222	CF, 2200 ohm
R994	24366272	CF, 2700 ohm
R995	24366102	CF, 1k ohm
R996	24366103	CF, 10k ohm
R997	24366272	CF, 2700 ohm
R998	24366102	CF, 1k ohm
R999	24366102	CF, 1k ohm
R7707	24366472	CF, 4700 ohm
R7708	24366472	CF, 4700 ohm
R7710	24555680	OMF, 68 ohm, 3W
R7711	24323229	MF, 2.2 ohm, 2W
R7712	24366472	CF, 4700 ohm
R7713	24366472	CF, 4700 ohm
R7715	24555680	OMF, 68 ohm, 3W
R7716	24323229	MF, 2.2 ohm, 2W
R7717	24366472	CF, 4700 ohm

Location No.	Part No.	Description
R7718	24366472	CF, 4700 ohm
R7720	24555680	OMF, 68 ohm, 3W
R7721	24323229	MF, 2.2 ohm, 2W
R7722	24366472	CF, 4700 ohm
R7723	24366472	CF, 4700 ohm
R7725	24555680	OMF, 68 ohm, 3W
R7726	24323229	MF, 2.2 ohm, 2W
R7727	24366472	CF, 4700 ohm
R7728	24366472	CF, 4700 ohm
R7730	24555680	OMF, 68 ohm, 3W
R7731	24323229	MF, 2.2 ohm, 2W
R7732	24366472	CF, 4700 ohm
R7733	24366472	CF, 4700 ohm
R7735	24555680	OMF, 68 ohm, 3W
R7736	24323229	MF, 2.2 ohm, 2W
R7738	24383101	OMF, 100 ohm, 2W
R7741	24366102	CF, 1k ohm
R7742	24366472	CF, 4700 ohm
R7743	24366223	CF, 22k ohm
R7744	24366102	CF, 1k ohm
R7745	24366332	CF, 3300 ohm
R7746	24366223	CF, 22k ohm
R7747	24366222	CF, 2200 ohm
R7749	24366331	CF, 330 ohm
R7750	24323278	MF, 0.27 ohm, 2W
R7751	24366471	CF, 470 ohm
R7757	24366223	CF, 22k ohm
R7758	24366222	CF, 2200 ohm
R7763	24366471	CF, 470 ohm
R7764	24366331	CF, 330 ohm
R7765	24339398	MF, 0.39 ohm, 2W
R7766	24366223	CF, 22k ohm
R7767	24366223	CF, 22k ohm
R7768	24366102	CF, 1k ohm
R7771	24366102	CF, 1k ohm
R7772	24366102	CF, 1k ohm
R7774	24383151	OMF, 150 ohm, 2W
R7775	24366273	CF, 27k ohm
R7776	24366472	CF, 4700 ohm
R7777	24366273	CF, 27k ohm
R7778	24366472	CF, 4700 ohm
R7779	24366102	CF, 1k ohm
R7780	24366102	CF, 1k ohm
R7781	24366333	CF, 33k ohm
R7782	24339828	OMF, 0.82 ohm, 2W
R7783	24366331	CF, 330 ohm
R7784	24366471	CF, 470 ohm
R7785	24366222	CF, 2200 ohm
R7786	24366103	CF, 10k ohm
R7787	24366104	CF, 100k ohm
R7788	24366103	CF, 10k ohm
R7789	24366471	CF, 470 ohm
R7790	24552182	OMF, 1800 ohm, 1/2W
R7791	24552681	OMF, 680 ohm, 1/2W
R7792	24366471	CF, 470 ohm
R7793	24552182	OMF, 1800 ohm, 1/2W
R7795	24366101	CF, 100 ohm
R7796	24366101	CF, 100 ohm
R7797	24366101	CF, 100 ohm
R7798	24366102	CF, 1k ohm
RA03	24366102	CF, 1k ohm
RA04	24366102	CF, 1k ohm
RA05	24366102	CF, 1k ohm
RA06	24366102	CF, 1k ohm

Location No.	Part No.	Description
RA07	24366102	CF, 1k ohm
RA08	24366102	CF, 1k ohm
RA09	24366102	CF, 1k ohm (TZ50V61)
RA10	24366102	CF, 1k ohm
RA13	24366103	CF, 10k ohm
RA14	24366102	CF, 1k ohm
RA15	24366102	CF, 1k ohm
RA16	24366102	CF, 1k ohm
RA17	24366102	CF, 1k ohm
RA18	24366102	CF, 1k ohm
RA19	24366102	CF, 1k ohm
RA21	24366102	CF, 1k ohm
RA22	24366331	CF, 330 ohm
RA23	24366331	CF, 330 ohm
RA24	24366331	CF, 330 ohm
RA25	24366332	CF, 3300 ohm
RA33	24366103	CF, 10k ohm
RA34	24366102	CF, 1k ohm
RA35	24366102	CF, 1k ohm
RA36	24366103	CF, 10k ohm
RA37	24366101	CF, 100 ohm
RA38	24366101	CF, 100 ohm
RA40	24366101	CF, 100 ohm
RA41	24366101	CF, 100 ohm
RA57	24366223	CF, 22k ohm
RA61	24366103	CF, 10k ohm
RA62	24366103	CF, 10k ohm
RA70	24366333	CF, 33k ohm
RA71	24366683	CF, 68k ohm
RA72	24366223	CF, 22k ohm
RA73	24366103	CF, 10k ohm
RA75	24366333	CF, 33k ohm
RA76	24366822	CF, 8200 ohm
RA77	24366153	CF, 15k ohm
RA78	24366273	CF, 27k ohm
RA79	24366823	CF, 82k ohm
RA81	24366101	CF, 100 ohm
RA82	24366101	CF, 100 ohm
RA83	24366101	CF, 100 ohm
RB01	24366271	CF, 270 ohm
RB02	24366102	CF, 1k ohm
RB03	24366101	CF, 100 ohm
RB04	24366103	CF, 10k ohm
RB10	24366153	CF, 15k ohm
RB11	24366153	CF, 15k ohm
RB12	24366332	CF, 3300 ohm
RB13	24366332	CF, 3300 ohm
RB14	24366153	CF, 15k ohm
RB15	24366471	CF, 470 ohm
RB15	24366153	CF, 15k ohm
RB16	24366332	CF, 3300 ohm
RB17	24366332	CF, 3300 ohm
RB18	24366103	CF, 10k ohm
RB19	24366470	CF, 47 ohm
RB19	24366101	CF, 100 ohm
RB20	24366102	CF, 1k ohm
RB21	24366103	CF, 10k ohm
RB22	24366331	CF, 330 ohm
RB23	24366331	CF, 330 ohm
RB24	24366331	CF, 330 ohm
RB25	24366332	CF, 3300 ohm
RB26	24366103	CF, 10k ohm
RB27	24366102	CF, 1k ohm
RB30	24366103	CF, 10k ohm

Location No.	Part No.	Description
RB33	24366103	CF, 10k ohm
RB35	24366102	CF, 1k ohm
RB37	24366101	CF, 100 ohm
RB38	24366101	CF, 100 ohm
RB40	24366101	CF, 100 ohm
RB41	24366101	CF, 100 ohm
RB41	24366681	CF, 680 ohm
RB41	24366273	CF, 27k ohm
RB42	24366153	CF, 15k ohm
RB56	24366102	CF, 1k ohm
RB61	24366222	CF, 2200 ohm
RB62	24366101	CF, 100 ohm
RB63	24366472	CF, 4700 ohm
RB66	24366222	CF, 2200 ohm
RB67	24366103	CF, 10k ohm
RB81	24366122	CF, 1200 ohm
RB82	24366123	CF, 12k ohm
RB83	24366123	CF, 12k ohm
RB84	24366562	CF, 5600 ohm
RB90	24366392	CF, 3900 ohm
RB91	24366473	CF, 47k ohm
RB92	24366271	CF, 270 ohm
RB93	24366271	CF, 270 ohm
RB94	24366222	CF, 2200 ohm
RB95	24366222	CF, 2200 ohm
RB96	24366273	CF, 27k ohm
RB97	24366273	CF, 27k ohm
RB98	24366102	CF, 1k ohm
RD09	24366101	CF, 100 ohm
RD11	24366101	CF, 100 ohm
RD13	24366229	CF, 2.2 ohm
RD14	24366103	CF, 10k ohm
RD16	24366103	CF, 10k ohm
RR01	24366102	CF, 1k ohm
RR02	24366104	CF, 100k ohm
RR03	24366222	CF, 2200 ohm
RR04	24366101	CF, 100 ohm
RR06	24366102	CF, 1k ohm
RR07	24366102	CF, 1k ohm
RR08	24366332	CF, 3300 ohm
RR09	24366222	CF, 2200 ohm
RR10	24366102	CF, 1k ohm
RR11	24366272	CF, 2700 ohm
RR12	24366152	CF, 1500 ohm
RR13	24366152	CF, 1500 ohm
RR14	24366152	CF, 1500 ohm
RR15	24366391	CF, 390 ohm
RR16	24366391	CF, 390 ohm
RR17	24366391	CF, 390 ohm
RR18	24366332	CF, 3300 ohm
RR19	24366102	CF, 1k ohm
RR22	24366223	CF, 22k ohm
RR23	24366223	CF, 22k ohm
RR24	24366102	CF, 1k ohm
RR25	24366101	CF, 100 ohm
RR26	24366222	CF, 2200 ohm
RR27	24366681	CF, 680 ohm
RR28	24366681	CF, 680 ohm
RR29	24366681	CF, 680 ohm
RR30	24366222	CF, 2200 ohm
RR31	24366222	CF, 2200 ohm
RR32	24366222	CF, 2200 ohm
RR33	24366822	CF, 8200 ohm
RR34	24366822	CF, 8200 ohm

Location No.	Part No.	Description
RR35	24366822	CF, 8200 ohm
RR36	24366102	CF, 1k ohm
RR37	24366102	CF, 1k ohm
RR38	24366102	CF, 1k ohm
RR39	24366222	CF, 2200 ohm
RR40	24366101	CF, 100 ohm
RR42	24366101	CF, 100 ohm
RR44	24366101	CF, 100 ohm
RR46	24366222	CF, 2200 ohm
RR47	24366222	CF, 2200 ohm
RR48	24366222	CF, 2200 ohm
RR50	24366103	CF, 10k ohm
RR51	24366103	CF, 10k ohm
RR52	24366102	CF, 1k ohm
RR53	24366471	CF, 470 ohm
RR54	24366102	CF, 1k ohm
RR55	24366471	CF, 470 ohm
RR56	24366102	CF, 1k ohm
RR57	24366471	CF, 470 ohm
RR58	24366103	CF, 10k ohm(TZ50V51)
RR59	24366393	CF, 39k ohm(TZ50V51)
RR61	24366332	CF, 3300 ohm
RR62	24366332	CF, 3300 ohm
RR63	24366332	CF, 3300 ohm
RR92	24366222	CF, 2200 ohm
RR99	24366102	CF, 1k ohm
RS02	24366472	CF, 4700 ohm
RS04	24366102	CF, 1k ohm
RS06	24366102	CF, 1k ohm
RS07	24366103	CF, 10k ohm
RS08	24366103	CF, 10k ohm
RS12	24366103	CF, 10k ohm
RS21	24366104	CF, 100k ohm
RS22	24366104	CF, 100k ohm
RS25	24366223	CF, 22k ohm
RS26	24366223	CF, 22k ohm
RS27	24366471	CF, 470 ohm
RS28	24366471	CF, 470 ohm
RS29	24366104	CF, 100k ohm
RS30	24366104	CF, 100k ohm
RS31	24366103	CF, 10k ohm
RS32	24366104	CF, 100k ohm
RS33	24366222	CF, 2200 ohm
RS34	24366222	CF, 2200 ohm
RS35	24366103	CF, 10k ohm
RS36	24366103	CF, 10k ohm
RS37	24366101	CF, 100 ohm
RS40	24366101	CF, 100 ohm
RS42	24366101	CF, 100 ohm
RS48	24366101	CF, 100 ohm
RS49	24366103	CF, 10k ohm
RS51	24366103	CF, 10k ohm
RS52	24366103	CF, 10k ohm
RS101	24366123	CF, 12k ohm
RS102	24366123	CF, 12k ohm
RS103	24366103	CF, 10k ohm
RS104	24366473	CF, 47k ohm
RS105	24366222	CF, 2200 ohm
RS107	24366473	CF, 47k ohm
RS108	24366473	CF, 47k ohm
RS109	24366153	CF, 15k ohm
RS110	24366101	CF, 100 ohm
RS112	24366223	CF, 22k ohm
RS113	24366153	CF, 15k ohm

Location No.	Part No.	Description
RS114	24366101	CF, 100 ohm
RS116	24366223	CF, 22k ohm
RV03	24366101	CF, 100 ohm
RV04	24366101	CF, 100 ohm
RV10	24366100	CF, 10 ohm
RV11	24366100	CF, 10 ohm
RV12	24366100	CF, 10 ohm
RV13	24366100	CF, 10 ohm
RV14	24366100	CF, 10 ohm
RV15	24366222	CF, 2200 ohm
RV20	24366750	CF, 75 ohm
RV21	24366750	CF, 75 ohm (TZ50V61)
RV22	24366750	CF, 75 ohm (TZ60V51)
RV23	24366332	CF, 3300 ohm (TZ60V51)
RV24	24366680	CF, 68 ohm
RV25	24366750	CF, 75 ohm
RV26	24366750	CF, 75 ohm
RV31	24366332	CF, 3300 ohm
RV32	24366750	CF, 75 ohm
RV33	24366680	CF, 68 ohm
RV34	24366750	CF, 75 ohm
RV40	24366822	CF, 8200 ohm
RV41	24366472	CF, 4700 ohm
RV42	24366561	CF, 560 ohm
RV43	24366471	CF, 470 ohm
RV44	24366471	CF, 470 ohm
RV45	24366222	CF, 2200 ohm
RV46	24366102	CF, 1k ohm
RV47	24366102	CF, 1k ohm
RV48	24366102	CF, 1k ohm
RV49	24366102	CF, 1k ohm
RV60	24366682	CF, 6800 ohm
RV63	24366102	CF, 1k ohm
RV67	24366750	CF, 75 ohm
RV68	24366181	CF, 180 ohm
RV69	24366101	CF, 100 ohm
RV74	24366680	CF, 68 ohm
RV83	24366332	CF, 3300 ohm
RV84	24366750	CF, 75 ohm
RV85	24552181	OMF, 180 ohm, 1/2W
RV89	24366750	CF, 75 ohm
RV90	24366103	CF, 10k ohm
RV91	24366302	CF, 3k ohm
RV92	24366103	CF, 10k ohm
RV93	24366103	CF, 10k ohm
RV94	24366392	CF, 3900 ohm
RV95	24366123	CF, 12k ohm
RV96	24366274	CF, 270k ohm
RV97	24366331	CF, 330 ohm
RV98	24366472	CF, 4700 ohm
RW01	24366683	CF, 68k ohm
RW02	24366821	CF, 820 ohm
RW02	24366473	CF, 47k ohm
RW03	24366333	CF, 33k ohm
RW04	24366153	CF, 15k ohm
RW05	24366102	CF, 1k ohm
RW07	24366222	CF, 2200 ohm
RW09	24366563	CF, 56k ohm
RW10	24366102	CF, 1k ohm
RW13	24366393	CF, 39k ohm
RW14	24552121	OMF, 120 ohm, 1/2W
RW14	24366101	CF, 100 ohm
RW15	24366223	CF, 22k ohm
RW16	24366101	CF, 100 ohm

Location No.	Part No.	Description
RW16	24366273	CF, 27k ohm
RW17	24366333	CF, 33k ohm
RW18	24366101	CF, 100 ohm
RW18	24366103	CF, 10k ohm
RW19	24366100	CF, 10 ohm
RW19	24366473	CF, 47k ohm
RW20	24366392	CF, 3900 ohm
RW22	24366102	CF, 1k ohm
RW23	24366471	CF, 470 ohm
RW24	24366471	CF, 470 ohm
RW24	24366470	CF, 47 ohm
RW25	24366182	CF, 1800 ohm
RW26	24366682	CF, 6800 ohm
RW27	24366682	CF, 6800 ohm
RW28	24366751	CF, 750 ohm
RW30	24366102	CF, 1k ohm
RW30	24552100	OMF, 10 ohm, 1/2W
RW31	24552331	OMF, 330 ohm, 1/2W
RW32	24366820	CF, 82 ohm
RW32	24366820	CF, 82 ohm
RW33	24366683	CF, 68k ohm
RW33	24366683	CF, 68k ohm
RW34	24366820	CF, 82 ohm
RW35	24366683	CF, 68k ohm
RW36	24366330	CF, 33 ohm
RW37	24366152	CF, 1500 ohm
RW38	24366102	CF, 1k ohm
RW39	24366152	CF, 1500 ohm
RW40	24366182	CF, 1800 ohm
RW40	24366330	CF, 33 ohm
RW41	24366279	CF, 2.7 ohm
RW41	24366102	CF, 1k ohm
RW42	24366279	CF, 2.7 ohm
RW42	24366101	CF, 100 ohm
RW43	24554221	OMF, 220 ohm, 2W
RW43	24366101	CF, 100 ohm
RW44	24366122	CF, 1200 ohm
RW44	24366101	CF, 100 ohm
RW45	24366122	CF, 1200 ohm
RY01	24366103	CF, 10k ohm
RY10	24366103	CF, 10k ohm
RY11	24366102	CF, 1k ohm
RY80	24366331	CF, 330 ohm
RY81	24366101	CF, 100 ohm
RY82	24366102	CF, 1k ohm
RY87	24366100	CF, 10 ohm
RZ01	24366101	CF, 100 ohm
RZ02	24366221	CF, 220 ohm
RZ03	24366102	CF, 1k ohm
RZ04	24366102	CF, 1k ohm
RZ05	24366821	CF, 820 ohm
RZ08	24366102	CF, 1k ohm
RZ09	24366221	CF, 220 ohm
RZ10	24366561	CF, 560 ohm
RZ11	24366391	CF, 390 ohm

### COILS & TRANSFORMERS

L104	23289680	Coil, Peaking, TRF4680AF
L111	23238562	Coil, Peaking, TRF4109AJ (TZ50V61)
L112	23238562	Coil, Peaking, TRF4109AJ (TZ50V61)
L113	23289220	Coil, Peaking, TRF4220AF
L115	23103852	Coil, Filter, TEM2028AH

Location No.	Part No.	Description
L301	23103859	Coil (Ferrite Bead), TEM2011
L303	23237975	Coil, Peaking, TRF4101AC
L400	23289100	Coil, Peaking, TRF4100AF
L405	23289101	Coil, Peaking, TRF4101AF
△L441	23233947	Coil, Linearity, TLN2144G
L442	23248186	Coil, Choke, TLN3346AD
△L461	23248175	Coil, Choke, TLN3335AD
△L462	23231135	Deflection Yoke, TDY707AS(R)
△L463	23231135	Deflection Yoke, TDY707AS(R)
△L464	23231135	Deflection Yoke, TDY707AS(R)
L465	23103880	Coil (Ferrite Bead), TEM2011Y
L472	23102457	Magnet, MAG-1102
L473	23102457	Magnet, MAG-1102
L474	23102457	Magnet, MAG-1102
L501	23289470	Coil, Peaking, TRF4470AF
L502	23289470	Coil, Peaking, TRF4470AF
L503	23289470	Coil, Peaking, TRF4470AF
L701	23238562	Coil, Peaking, TRF4109AJ
L702	23238562	Coil, Peaking, TRF4109AJ
L707	23238562	Coil, Peaking, TRF4109AJ
L708	23238562	Coil, Peaking, TRF4109AJ
L709	23238562	Coil, Peaking, TRF4109AJ
L710	23238562	Coil, Peaking, TRF4109AJ
L711	23238562	Coil, Peaking, TRF4109AJ
L712	23238562	Coil, Peaking, TRF4109AJ
L713	23238562	Coil, Peaking, TRF4109AJ
L714	23238562	Coil, Peaking, TRF4109AJ
L719	23232878	Coil, Variable, TRF3503K
L720	23289102	Coil, Peaking, TRF4102AJ
L721	23237805	Coil, Peaking, TRF4222
L722	23289102	Coil, Peaking, TRF4102AJ
L723	23237805	Coil, Peaking, TRF4222
L724	23289102	Coil, Peaking, TRF4102AJ
L725	23237805	Coil, Peaking, TRF4222
L726	23289102	Coil, Peaking, TRF4102AJ
L727	23237805	Coil, Peaking, TRF4222
L728	23289102	Coil, Peaking, TRF4102AJ
L729	23237805	Coil, Peaking, TRF4222
L730	23289102	Coil, Peaking, TRF4102AJ
L731	23237805	Coil, Peaking, TRF4222
L737	23289560	Coil, Peaking, TRF4560
L738	23289560	Coil, Peaking, TRF4560
L739	23289560	Coil, Peaking, TRF4560
L740	23289560	Coil, Peaking, TRF4560
L742	23103866	Chip (Ferrite Bead), TEM2105T
L743	23103866	Chip (Ferrite Bead), TEM2105T
L744	23103866	Chip (Ferrite Bead), TEM2105T
L745	23103866	Chip (Ferrite Bead), TEM2105T
L746	23103866	Chip (Ferrite Bead), TEM2105T
L747	23103866	Chip (Ferrite Bead), TEM2105T
L748	23103866	Chip (Ferrite Bead), TEM2105T
L749	23103866	Chip (Ferrite Bead), TEM2105T
L805	23248213	Coil, Choke, TLN3481AH
L806	23248213	Coil, Choke, TLN3481AH
L851	23103859	Coil (Ferrite Bead), TEM2011
L852	23103859	Coil (Ferrite Bead), TEM2011
L853	23103859	Coil (Ferrite Bead), TEM2011
L854	23103859	Coil (Ferrite Bead), TEM2011
L855	23103859	Coil (Ferrite Bead), TEM2011
L856	23103859	Coil (Ferrite Bead), TEM2011
L857	23248031	Coil, Choke, TLN3274D
L858	23248073	Coil, Choke, TLN3299D
L859	23248073	Coil, Choke, TLN3299D
L861	23103941	Coil (Ferrite Bead), TEM2000

Location No.	Part No.	Description
L862	23103859	Coil (Ferrite Bead), TEM2011
L881	23103859	Coil (Ferrite Bead), TEM2011
L882	23103859	Coil (Ferrite Bead), TEM2011
L883	23103859	Coil (Ferrite Bead), TEM2011
L884	23103859	Coil (Ferrite Bead), TEM2011
L885	23248073	Coil, Choke, TLN3299D
L886	23103859	Coil (Ferrite Bead), TEM2011
L887	23103859	Coil (Ferrite Bead), TEM2011
L888	23103859	Coil (Ferrite Bead), TEM2011
L889	23103859	Coil (Ferrite Bead), TEM2011
L891	23103859	Coil (Ferrite Bead), TEM2011
L892	23103859	Coil (Ferrite Bead), TEM2011
L893	23103859	Coil (Ferrite Bead), TEM2011
L894	23103859	Coil (Ferrite Bead), TEM2011
L895	23248087	Coil, Choke, TLN3312D
L896	23248087	Coil, Choke, TLN3312D
L897	23248087	Coil, Choke, TLN3312D
L911	23237987	Coil, Peaking, TRF4100AC
L961	23289100	Coil, Peaking, TRF4100AF
L962	23237991	Coil, Peaking, TRF4479AC
L963	23237975	Coil, Peaking, TRF4101AC
L7701	23103859	Coil (Ferrite Bead), TEM2011
L7702	23103859	Coil (Ferrite Bead), TEM2011
L7703	23103859	Coil (Ferrite Bead), TEM2011
L7704	23103859	Coil (Ferrite Bead), TEM2011
L7705	23103859	Coil (Ferrite Bead), TEM2011
L7706	23103859	Coil (Ferrite Bead), TEM2011
L7709	23238562	Coil, Peaking, TRF4109AJ
L7710	23238562	Coil, Peaking, TRF4109AJ
LA01	23289100	Coil, Peaking, TRF4100AF
LB01	23289100	Coil, Peaking, TRF4100AF
LR01	23289109	Coil, Peaking, TRF41R0AF
LR02	23289109	Coil, Peaking, TRF41R0AF
LV01	23103852	Coil, Filter, TEM2028AH
LV02	23103852	Coil, Filter, TEM2028AH (TZ50V61)
LV05	23289560	Coil, Peaking, TRF4560
LV06	23289560	Coil, Peaking, TRF4560
LV07	23238719	Coil, Peaking, TRF4399AJ
LV11	23289100	Coil, Peaking, TRF4100AF
LV13	23289100	Coil, Peaking, TRF4100AF
LV14	23289100	Coil, Peaking, TRF4100AF
LV20	23238705	Coil, Peaking, TRF4560AJ (TZ50V61)
LV41	23289150	Coil, Peaking, TRF4150AF
LW01	23103852	Coil, Filter, TEM2028AH
LW02	23103852	Coil, Filter, TEM2028AH
LW02	23261974	Coil, Choke, HC5-035
LW03	23103852	Coil, Filter, TEM2028AH
LW04	23238710	Coil, Peaking, TRF4220AJ
LW04	23103859	Coil (Ferrite Bead), TEM2011
LW05	23103859	Coil (Ferrite Bead), TEM2011
LW07	23289220	Coil, Peaking, TRF4220AF
LY01	23289150	Coil, Peaking, TRF4150AF
LY22	23103852	Coil, Filter, TEM2028AH
LZ01	23289330	Coil, Peaking, TRF4330AF
LZ02	23103880	Coil (Ferrite Bead), TEM2011Y
LZ03	23289339	Coil, Peaking, TRF43R3AF
LZ04	23103880	Coil (Ferrite Bead), TEM2011Y
LZ05	23289100	Coil, Peaking, TRF4100AF
LZ06	23289270	Coil, Peaking, TRF4270AF
LZ08	23289689	Coil, Peaking, TRF46R8AF
LZ09	23289339	Coil, Peaking, TRF43R3AF

Location No.	Part No.	Description
T400	23224364	Transformer, Focus, TLN2168AH
T401	23224367	Transformer, Horiz. Drive, TLN1098AH
△T461	23236552	Transformer, Flyback, TFB3078BD
T461A	23192917	Cabie, Anode
△T461Z	23236508	Transformer, Flyback, TFB3078ZD
T801	23211698	Line Filter, TRF3218AK
T802	23211712	Line Filter, TRF3209BQ
T840	23213513	Transformer, Power, TPW1459AZ
T862	23217406	Transformer, Converter, TPW3406AS
<b>SEMICONDUCTORS</b>		
Q151	23114530	Transistor, 2SA933S-Q (TZ50V61)
Q152	23114530	Transistor, 2SA933S-Q (TZ50V61)
Q201	23114528	Transistor, 2SC1740S-Q (TZ60V61)
Q202	23114528	Transistor, 2SC1740S-Q
Q203	A6734590	Transistor, 2SC752(G)TM-Y
Q205	23114528	Transistor, 2SC1740S-Q
Q261	23114528	Transistor, 2SC1740S-Q
Q262	23114530	Transistor, 2SA933S-Q
Q263	23114530	Transistor, 2SA933S-Q
Q301	23319787	IC, LA7833S
Q301B	70391355	Screw, BITTB3X8SZN
Q302	B0384625	IC, TA8859CP
Q340	A6317440	Transistor, 2SC1815-Y
Q341	A6534040	Transistor, 2SA1015-Y
Q350	A6317440	Transistor, 2SC1815-Y
Q351	A6534040	Transistor, 2SA1015-Y
Q352	A6002030	Transistor, RN1203
Q353	A6534145	Transistor, 2SA1020-Y(C)
Q353	A6002030	Transistor, RN1203
Q370	23114530	Transistor, 2SA933S-Q
Q402	A6330069	Transistor, 2SC2482 FA-1
Q404	A6873777	Transistor, 2SD2553
Q404B	72471082	Screw, BRDT2W3X10 SZN
Q420	23314141	Transistor, 2SC3852
Q420B	70391356	Screw, BITTB3X10 SZN
Q421	23114528	Transistor, 2SC1740S-Q
Q430	A6333346	Transistor, 2SC2655-Y(C)
Q460	A6625365	Transistor, 2SB688-O(BS)
Q460B	72471082	Screw, BRDT2W3X10 SZN
Q461	A6317440	Transistor, 2SC1815-Y
Q462	A6317440	Transistor, 2SC1815-Y
Q470	23114528	Transistor, 2SC1740S-Q
Q480	23314246	Transistor, 2SC2023 LF-4
Q501	B0385677	IC, TA1222BN
Q502	23114528	Transistor, 2SC1740S-Q
Q503	23114530	Transistor, 2SA933S-Q
Q601	23318413	IC, LA4282
Q612	23314962	Transistor, KTA1266Y
Q681	A6342200	Transistor, 2SC2878-A
Q682	A6342200	Transistor, 2SC2878-A
Q701	B0588213	IC, T7K64(Z)
Q703	23905014	IC, LC78816M
Q704	23905014	IC, LC78816M
Q705	23905014	IC, LC78816M

Location No.	Part No.	Description
Q707	B0379550	IC, TA8667P
Q709	A6734590	Transistor, 2SC752(G)TM-Y
Q710	23314204	Transistor, 2SC2412K,Q
Q713	23904755	IC, CAT24C04P
Q715	23319808	IC, M5218AP
Q717	23319808	IC, M5218AP
Q719	23319808	IC, M5218AP
Q751	23905094	IC, STK392-110
Q752	23905094	IC, STK392-110
Q754	23904521	IC, AN7805
Q754B	70391356	Screw, BITTB3X10 SZN
Q755	23904525	IC, AN7809
Q755B	70391356	Screw, BITTB3X10 SZN
Q756	23318841	IC, AN79M09F
Q756B	70391356	Screw, BITTB3X10 SZN
Q757	23114528	Transistor, 2SC1740S-Q
Q758	23114528	Transistor, 2SC1740S-Q
Q759	23114530	Transistor, 2SA933S-Q
Q760	23314141	Transistor, 2SC3852
Q760B	70391356	Screw, BITTB3X10 SZN
Q761	23114530	Transistor, 2SA933S-Q
Q762	23114528	Transistor, 2SC1740S-Q
Q764	B0487045	IC, TC74HC4049AP
Q765	23114528	Transistor, 2SC1740S-Q
Q766	23114528	Transistor, 2SC1740S-Q
Q767	B0470662	IC, TC4066BP
Q768	23114530	Transistor, 2SA933S-Q
Q769	23114528	Transistor, 2SC1740S-Q
Q770	23114530	Transistor, 2SA933S-Q
Q771	A6533730	Transistor, 2SA1012-Y
Q771B	23035308	Screw, BTB3X8SZN
Q801	23906253	IC, STR-Z4117
Q830	23314141	Transistor, 2SC3852
Q830B	70391356	Screw, BITTB3X10 SZN
Q831	23905949	IC, MC7805BT
Q831B	70391356	Screw, BITTB3X10 SZN
Q832	23905977	IC, PQ09RD11(TZ50V61)
Q832B	70391356	Screw, BITTB3X10 SZN
Q840	23318299	IC, L78MR05
Q841	70129444	IC, PST994D
Q843	A6002050	Transistor, RN1205
Q846	A6002050	Transistor, RN1205
Q862	A8643112	Photo Coupler, TLP621(GRL-L
Q901	A6372621	Transistor, 2SC5360
Q902	A6317440	Transistor, 2SC1815-Y
Q911	A6372621	Transistor, 2SC5360
Q913	A6317440	Transistor, 2SC1815-Y
Q914	A6321240	Transistor, 2SC2120-Y
Q921	A6372621	Transistor, 2SC5360
Q922	A6317440	Transistor, 2SC1815-Y
Q961	A6317440	Transistor, 2SC1815-Y
Q962	A6509140	Transistor, 2SA562TMY
Q963	A6317440	Transistor, 2SC1815-Y
Q964	A6534040	Transistor, 2SA1015-Y
Q965	A6317440	Transistor, 2SC1815-Y
Q966	A6534040	Transistor, 2SA1015-Y
Q971	A6317440	Transistor, 2SC1815-Y
Q972	A6534040	Transistor, 2SA1015-Y
Q973	A6317440	Transistor, 2SC1815-Y
Q974	A6534040	Transistor, 2SA1015-Y
Q975	A6317440	Transistor, 2SC1815-Y
Q976	A6317440	Transistor, 2SC1815-Y
Q981	A6534040	Transistor, 2SA1015-Y
Q982	A6534040	Transistor, 2SA1015-Y



Location No.	Part No.	Description
Q983	A6317440	Transistor, 2SC1815-Y
Q984	A6534040	Transistor, 2SA1015-Y
Q4833	B0345651	IC, TA7508P(J)
QA01	23906891	IC, 8700CSN-151(TZ50V61)
QA01	23906948	IC, 8700CSN-153(TZ50V51)
QA02	23905321	IC, 24LC16B-I/P
QB01	23114528	Transistor, 2SC1740S-Q
QB03	A6002050	Transistor, RN1205
QB13	23114530	Transistor, 2SA933S-Q
QB14	23114530	Transistor, 2SA933S-Q
QB30	23114528	Transistor, 2SC1740S-Q
QB61	23114528	Transistor, 2SC1740S-Q
QB81	A6342200	Transistor, 2SC2878-A
QB82	A6342200	Transistor, 2SC2878-A
QB83	23114530	Transistor, 2SA933S-Q
QB84	23114528	Transistor, 2SC1740S-Q
QB85	23114530	Transistor, 2SA933S-Q
QB86	23114530	Transistor, 2SA933S-Q
QB87	23114530	Transistor, 2SA933S-Q
QB88	23114530	Transistor, 2SA933S-Q
QB92	23114528	Transistor, 2SC1740S-Q
QD01	B0377277	IC, TA173AP
QR01	23906910	IC, MB90096-179
QR02	23114528	Transistor, 2SC1740S-Q
QR03	23114530	Transistor, 2SA933S-Q
QR04	70119743	IC, PST523D
QR05	B0487584	IC, TC74HC4053AP
QR06	23114528	Transistor, 2SC1740S-Q
QR07	23114528	Transistor, 2SC1740S-Q
QR08	23114530	Transistor, 2SA933S-Q
QR09	23114530	Transistor, 2SA933S-Q
QR10	23114530	Transistor, 2SA933S-Q
QR11	23114530	Transistor, 2SA933S-Q
QR12	23114530	Transistor, 2SA933S-Q
QR13	23114530	Transistor, 2SA933S-Q
QR14	23114530	Transistor, 2SA933S-Q
QR15	23114530	Transistor, 2SA933S-Q
QR16	23114530	Transistor, 2SA933S-Q
QR17	23119764	IC, TC4053BP (TZ50V51)
QS01	A6342200	Transistor, 2SC2878-A
QS11	A6342200	Transistor, 2SC2878-A
QS12	A6012040	Transistor, RN2204
QS13	23314965	Transistor, KTC3198 Y
QS14	23314965	Transistor, KTC3198 Y
QS101	23906596	IC, BA4558
QS102	A6012040	Transistor, RN2204
QS103	A6342200	Transistor, 2SC2878-A
QS104	A6342200	Transistor, 2SC2878-A
QV01	B0384761	IC, TA8851CN
QV20	A6002040	Transistor, RN1204
QV21	23114528	Transistor, 2SC1740S-Q
QV22	23114530	Transistor, 2SA933S-Q
QV23	23114530	Transistor, 2SA933S-Q
QV40	23114528	Transistor, 2SC1740S-Q
QV41	23114528	Transistor, 2SC1740S-Q
QV42	23114530	Transistor, 2SA933S-Q
QV43	23114530	Transistor, 2SA933S-Q
QV44	23114528	Transistor, 2SC1740S-Q
QV48	23114528	Transistor, 2SC1740S-Q
QW01	B0470532	IC, TC4053BP
QW02	23114528	Transistor, 2SC1740S-Q
QW03	23114528	Transistor, 2SC1740S-Q
QW04	23114528	Transistor, 2SC1740S-Q
QW05	23114528	Transistor, 2SC1740S-Q

Location No.	Part No.	Description
QW06	A6317440	Transistor, 2SC1815-Y
QW07	A6734590	Transistor, 2SC752(G)TM-Y
QW09	23114528	Transistor, 2SC1740S-Q
QW10	23114530	Transistor, 2SA933S-Q
QW10	23114530	Transistor, 2SA933S-Q
QW11	23114528	Transistor, 2SC1740S-Q
QW11	23314701	Transistor, 2SA1186A
QW12	23314705	Transistor, 2SD1763A
QW17	A6002010	Transistor, RN1201
QW18	23114530	Transistor, 2SA933S-Q
QW19	A6317440	Transistor, 2SC1815-Y
QW20	A6317440	Transistor, 2SC1815-Y
QY10	23114528	Transistor, 2SC1740S-Q
QY11	A6002040	Transistor, RN1204
QY26	23114528	Transistor, 2SC1740S-Q
QZ01	B0410867	IC, TC90A45P
QZ02	23114528	Transistor, 2SC1740S-Q
QZ03	23114528	Transistor, 2SC1740S-Q
QZ04	23114528	Transistor, 2SC1740S-Q
D101	23316411	Diode, 1SS184
D201	23118859	Diode, 1SS133
D215	23118859	Diode, 1SS133
D216	23118859	Diode, 1SS133
D217	23118859	Diode, 1SS133
D218	23118859	Diode, 1SS133
D219	23118859	Diode, 1SS133
D220	23118859	Diode, 1SS133
D221	23118859	Diode, 1SS133
D301	23118094	Diode, EU2A
D302	23118094	Diode, EU2A
D303	23118859	Diode, 1SS133
D308	23118822	Diode, ERB12-02
D309	23118822	Diode, ERB12-02
D315	23118859	Diode, 1SS133
D320	23316677	Diode, Zener, MTZJ6.8A
D332	23316794	Diode, SC570A
D340	23118859	Diode, 1SS133
D341	23316675	Diode, Zener, MTZJ6.2B
D350	23118859	Diode, 1SS133
D351	23118859	Diode, 1SS133
D352	23118859	Diode, 1SS133
D353	23316672	Diode, Zener, MTZJ5.6B
D354	23118859	Diode, 1SS133
D370	23316672	Diode, Zener, MTZJ5.6B
D371	23118859	Diode, 1SS133
D406	A7978850	Diode, S5295G
D408	23118338	Diode, RU4AM
D421	23118859	Diode, 1SS133
D427	23316680	Diode, Zener, MTZJ7.5A
D428	23316751	Diode, Zener, MTZJ30C
D429	23316751	Diode, Zener, MTZJ30C
D430	23316691	Diode, Zener, MTZJ10C
D431	23118859	Diode, 1SS133
D441	23316726	Diode, Zener, MTZJ15C
D443	23118338	Diode, RU4AM
D444	23118338	Diode, RU4AM
D448	23118056	Diode, AG01
D460	A7568480	Diode, TVR-1G
D461	23316582	Diode, ERC20-06
D463	23118859	Diode, 1SS133
D464	23316718	Diode, Zener, MTZJ12A
D465	23316718	Diode, Zener, MTZJ12A
D467	A7568752	Diode, 1S1887A
D470	23118859	Diode, 1SS133

Location No.	Part No.	Description
D471	A7568460	Diode, TVR-1B
D474	23316719	Diode, Zener, MTZJ12B
D481	23316726	Diode, Zener, MTZJ15C
D482	23118094	Diode, EU2A
D483	23316720	Diode, Zener, MTZJ12C
D484	23316678	Diode, Zener, MTZJ6.8B
D486	23118859	Diode, 1SS133
D487	23118094	Diode, EU2A
D488	23118859	Diode, 1SS133
D489	23316659	Diode, Zener, MTZJ3.6B
D512	23118859	Diode, 1SS133
D513	23316687	Diode, Zener, MTZJ9.1B
D601	23118859	Diode, 1SS133
D602	23118859	Diode, 1SS133
D603	23118859	Diode, 1SS133
D604	23118859	Diode, 1SS133
D607	23316737	Diode, Zener, MTZJ22A
D608	23316737	Diode, Zener, MTZJ22A
D611	23118859	Diode, 1SS133
D612	23118859	Diode, 1SS133
D614	23118859	Diode, 1SS133
D615	23118859	Diode, 1SS133
D616	23316672	Diode, Zener, MTZJ5.6B
D701	23115537	Diode, 1SS131
D702	23115537	Diode, 1SS131
D703	23115537	Diode, 1SS131
D704	23115537	Diode, 1SS131
D801	23316784	Diode, RBV-1506
D801B	70391355	Screw, BITTB3X8SZN
D830	23316673	Diode, Zener, MTZJ5.6C
D840	23316962	Diode, S1WBA20 4101
D845	23118859	Diode, 1SS133
D846	23118859	Diode, 1SS133
D851	23316402	Diode, RL4Z
D852	23316402	Diode, RL4Z
D853	23316402	Diode, RL4Z
D854	23316402	Diode, RL4Z
D855	23316813	Diode, EG1
D856	23316813	Diode, EG1
D862	23118094	Diode, EU2A
D864	23316813	Diode, EG1
D873	23316690	Diode, Zener, MTZJ10B
D875	23316689	Diode, Zener, MTZJ10A
D876	23316747	Diode, Zener, MTZJ27C
D881	23118859	Diode, 1SS133
D882	23316531	Diode, RG4
D883	23316531	Diode, RG4
D884	23316531	Diode, RG4
D885	23316531	Diode, RG4
D886	23316399	Diode, EL1Z
D887	23316399	Diode, EL1Z
D888	23316399	Diode, EL1Z
D889	23316399	Diode, EL1Z
D891	23316714	Diode, RL2Z
D892	23316714	Diode, RL2Z
D893	23316714	Diode, RL2Z
D894	23316714	Diode, RL2Z
D899	24019471	Varistor, TNR10V271K2
D901	23118859	Diode, 1SS133
D902	23118859	Diode, 1SS133
D903	23118859	Diode, 1SS133
D911	23118859	Diode, 1SS133
D912	23118859	Diode, 1SS133
D913	23118859	Diode, 1SS133

Location No.	Part No.	Description
D915	23118859	Diode, 1SS133
D921	23118859	Diode, 1SS133
D922	23118859	Diode, 1SS133
D924	23118859	Diode, 1SS133
D925	23118859	Diode, 1SS133
D926	23118859	Diode, 1SS133
D961	23118859	Diode, 1SS133
D962	23118859	Diode, 1SS133
D965	23118859	Diode, 1SS133
D966	23118859	Diode, 1SS133
D7701	23118859	Diode, 1SS133
D7702	23115532	Diode, ERB12-01
D7703	23316751	Diode, Zener, MTZJ30C
D7705	23118859	Diode, 1SS133
D7706	23118859	Diode, 1SS133
D7707	23118859	Diode, 1SS133
D7708	23118859	Diode, 1SS133
D7709	23316675	Diode, Zener, MTZJ6.2B
D7710	23316716	Diode, Zener, MTZJ11B
D7711	23316716	Diode, Zener, MTZJ11B
D7712	23118859	Diode, 1SS133
D7713	23118859	Diode, 1SS133
D7717	23316675	Diode, Zener, MTZJ6.2B
D7718	23316675	Diode, Zener, MTZJ6.2B
D7719	23316675	Diode, Zener, MTZJ6.2B
D7720	23316675	Diode, Zener, MTZJ6.2B
D7721	23316675	Diode, Zener, MTZJ6.2B
D7722	23316675	Diode, Zener, MTZJ6.2B
DA01	23316675	Diode, Zener, MTZJ6.2B
DA02	23316675	Diode, Zener, MTZJ6.2B
DA10	23118859	Diode, 1SS133
DA11	23118859	Diode, 1SS133
DA37	23118859	Diode, 1SS133
DA38	23118859	Diode, 1SS133
DA43	23118859	Diode, 1SS133
DA44	23118859	Diode, 1SS133
DA45	23118859	Diode, 1SS133
DA46	23118859	Diode, 1SS133
DB01	23358493	LED, SPR54MVWFLMN
DB01	23316675	Diode, Zener, MTZJ6.2B
DB13	23358522	LED, SIR-56SB3F
DB30	23118859	Diode, 1SS133
DR01	23118859	Diode, 1SS133
DR02	23118859	Diode, 1SS133
DR03	23118859	Diode, 1SS133
DR04	23118859	Diode, 1SS133
DR05	23316675	Diode, Zener, MTZJ6.2B
DV01	23316686	Diode, Zener, MTZJ9.1A
DV02	23316686	Diode, Zener, MTZJ9.1A
DV03	23316686	Diode, Zener, MTZJ9.1A
DV07	23316686	Diode, Zener, MTZJ9.1A
DV08	23316686	Diode, Zener, MTZJ9.1A (TZ50V61)
DV09	23316686	Diode, Zener, MTZJ9.1A (TZ50V61)
DV11	23316686	Diode, Zener, MTZJ9.1A
DV12	23316686	Diode, Zener, MTZJ9.1A
DV13	23316686	Diode, Zener, MTZJ9.1A
DV17	23316686	Diode, Zener, MTZJ9.1A
DV25	23118859	Diode, 1SS133
DV60	23118859	Diode, 1SS133
DW04	23118859	Diode, 1SS133
DW05	23118859	Diode, 1SS133
DW21	23118859	Diode, 1SS133

Location No.	Part No.	Description
DY10	23118859	Diode, 1SS133
<b>MISCELLANEOUS</b>		
B110	23470547	Back Terminal Board (TZ50V61)
B110	23470565	Back Terminal Board (TZ50V51)
B224	23035412	Screw, BTB4X12SZN
B225	23035412	Screw, BTB4X12SZN
B230	23037312	Screw, BTBW3X12SZN
B232	23037312	Screw, BTBW3X12SZN
B233	23035412	Screw, BTB4X12SZN
B234	23035412	Screw, BTB4X12SZN
B235	23035310	Screw, BTB3X10SZN
B236	23037312	Screw, BTBW3X12SZN
B237	23035412	Screw, BTB4X12SZN
B238	23035412	Screw, BTB4X12SZN
B251	23037312	Screw, BTBW3X12SZN
BB10	23903022	Socket, 8P, 2.5
BB100	23368627	Plug, 8P, 2.5
BB11	23903022	Socket, 8P, 2.5
BB20	23903022	Socket, 8P, 2.5
BB200	23368627	Plug, 8P, 2.5
BB21	23903022	Socket, 8P, 2.5
BB30	23903022	Socket, 8P, 2.5
BB300	23368627	Plug, 8P, 2.5
BB31	23903022	Socket, 8P, 2.5
F470	23144849	Fuse, 2.0A
F470A	23165433	Holder, Fuse
F801	23144481	Fuse, 7.0A, 125V
F801A	23165433	Holder, Fuse
F850	23144888	Fuse, 5.0A, 125V
F850A	23165433	Holder, Fuse
F860	23144456	Fuse, 5.0A, 125V
F889	23144893	Fuse, 3.15A
F889A	23165433	Holder, Fuse
F890	23144893	Fuse, 3.15A
F890A	23165433	Holder, Fuse
G005	23118859	Diode, 1SS133
G011	24366101	CF, 100 ohm
G012	24366101	CF, 100 ohm
G023	24327180	MF, 18 ohm, $\pm 1\%$ , 1/4W
G402	24366102	CF, 1k ohm
H002	23148349	Module, MVUS35A
H003	23344421	RF Switch, RSU133X6
H003A	23740989	F-Connector
KB11	23904946	Remote Sensor, RPM-676CBR-S
P121	23368520	Plug, 20P 2MM
P122	23902863	Socket, 20P 2MM
P301	23902863	Socket, 20P 2MM
P350	23368520	Plug, 20P 2MM
P420	23368020	Plug, 2P 5MM
P430	23368020	Plug, 2P 5MM
P513	23902863	Socket, 20P 2MM
P521	23368520	Plug, 20P 2MM
P522	23902863	Socket, 20P 2MM
P701	23368520	Plug, 20P 2MM
P702	23368520	Plug, 20P 2MM
P708	23902863	Socket, 20P 2MM
P709	23902863	Socket, 20P 2MM
P713	23164787	Plug, 7P
P714	23164787	Plug, 7P
P715	23164787	Plug, 7P

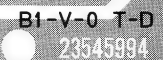
Location No.	Part No.	Description
P720	23164786	Plug, 6P
P801	23372078	Power Cord
P808	23164722	Plug, 5P
P818	23164722	Plug, 5P
PV02	23365819	Jack, 1S3P
PV05	23368520	Plug, 20P 2MM
PZ01	23368006	Plug, 8P, 2.5MM
PZ02	23902743	Socket, 8P, 2.5MM
S602	23145412	Switch, Slide, 2C2P(TZ50V61)
SA01	23145226	Switch, Push, 1C1P
SA02	23145226	Switch, Push, 1C1P
SA03	23145226	Switch, Push, 1C1P
SA04	23145226	Switch, Push, 1C1P
SA05	23145226	Switch, Push, 1C1P
SA06	23145226	Switch, Push, 1C1P
SA07	23145226	Switch, Push, 1C1P
SA08	23145226	Switch, Push, 1C1P
SA09	23145226	Switch, Push, 1C1P
SR81	23146564	Relay, DC12V
SR82	23146564	Relay, DC12V
V901A	23902019	Socket, CRT, 10P
V902A	23902019	Socket, CRT, 10P
V903A	23902019	Socket, CRT, 10P
W661	23151232	Speaker, SPK-1235, 160x160mm, 8 ohm
W662	23151232	Speaker, SPK-1235, 160x160mm, 8 ohm
X401	23153721	Ceramic Resonator, 503kHz, TCR1023
X501	23153961	Crystal, 3.58MHz
XA01	23153325	Ceramic Resonator, 8.00M, TCR1056
XB01	23153325	Ceramic Resonator, 8.00M, TCR1056
Z410	23110841	Focus Pack, TPA6030
Z410A	23505177	Focus Cable
Z450	24082877	CR Block, TPA5007
Z450A	23504953	Cable, Anode
Z702	23103823	Filter, TEM2027D
Z703	23103823	Filter, TEM2027D
Z704	23103823	Filter, TEM2027D
Z705	23103823	Filter, TEM2027D
Z706	23103823	Filter, TEM2027D
Z707	23103823	Filter, TEM2027D
Z711	23103823	Filter, TEM2027D
Z712	23103823	Filter, TEM2027D
△Z801	23905010	IC, HIC1019
ZM01	23262280	Coil, IF, TRF1196D
ZT01	70108925	Ceramic Resonator, TCR1071
ZT01	70108925	Ceramic Resonator, TCR1071
ZY01	23148292	Module, MWUS13H, NTSC/US (TZ50V61)
ZY01	23148353	Module, MKMU32, MULTI PICTURE(TZ50V51)
<b>PC BOARD ASSEMBLIES</b>		
* E031Z		CRT-D/R Board, PB8759A1 (TZ50V61)
* E031Z		CRT-D/R Board, PB8759B1 (TZ50V51)
* E032Z		CRT-D/G Board, PB8759A2 (TZ50V61)
* E032Z		CRT-D/G Board, PB8759B2 (TZ50V51)

Location No.	Part No.	Description
* E033Z		CRT-D/B Board, PB8759A3 (TZ50V61)
* E033Z		CRT-D/B Board, PB8759B3 (TZ50V51)
* E034Z		FRONT-CON Board, PB8759A4 (TZ50V61)
* E034Z		FRONT-CON Board, PB8759B4 (TZ50V51)
* E035Z		FRONT-IN Board, PB8759A5 (TZ50V61)
* E035Z		FRONT-IN Board, PB8759B5 (TZ50V51)
* E036Z		SVM Board, PB8759A6
* E037Z		DIGI-COMB Board, PB8759A7 (TZ50V61)
* E037Z		DIGI-COMB Board, PB8759B7 (TZ50V51)
* E040Z		REM Board, PB8759A10 (TZ50V61)
* E040Z		REM Board, PB8759B10 (TZ50V51)
* U421		DPC Board, PB8760A1 (TZ50V61)
* U421		DPC Board, PB8760B1 (TZ50V51)
* U701		D-CONVER Board, PB6340
* U801		CONV-OUT Board, PB8757A (TZ50V61)
* U801		CONV-OUT Board, PB8757B (TZ50V51)
* U821		Power Board, PB8760A2 (TZ50V61)
* U821		Power Board, PB8760B2 (TZ50V51)
* U901		Signal Board, PB8755A (TZ50V61)
* U901		Signal Board, PB8755B (TZ50V51)
* UM01		VCD/MAICON Board, PB8758A (TZ50V61)
* UM01		VCD/MAICON Board, PB8758B (TZ50V51)
* UV01		A/V Board, PB8760A3 (TZ50V61)
* UV01		A/V Board, PB8760B3 (TZ50V51)
<b>PICTURE TUBE</b>		
△ V901R	23796001	Projection Tube Ass'y 50HR
△ V902G	23796002	Projection Tube Ass'y 50HG
△ V903B	23796003	Projection Tube Ass'y 50HB
<b>TUNER</b>		
H001	23321342	Tuner, ELA22L
HY01	23321333	Tuner, ELA23LV(TZ50V61)
<b>ACCESSOIRES</b>		
K912	23306269	Remote Hand Unit, CT-9954 (TZ50V61)
K912	23306267	Remote Hand Unit, CT-9952 (TZ50V51)
AT03	23588181	Battery Cover
Y101	23563585	Owner's Manual, English, TZ50V61

Location No.	Part No.	Description
Y101	23563625	Owner's Manual, English, TZ50V51
Y101F	23563586	Owner's Manual, French, TZ50V61
Y101F	23563626	Owner's Manual, French, TZ50V51
<b>CABINET PARTS</b>		
A101	23411115	Wood Cabinet
A102	23527067	Speaker Grille, R
A103	23527068	Speaker Grille, L
A126	23445281	Button, Catch Male
A127	23445281	Button, Catch Male
A150	23411114	Light Box
A160	23469228	Caster
A175	23421928	Piece, Bezel Hanging
A201	23549258	Bezel
A202	23450099	Control Panel(TV50V61)
A202	23450142	Control Panel(TV50V51)
A213	23427652	Door
A268	23450101	Front Panel
A322	23445282	Button, Catch Female
A424	23549259	Back Board
A505	72471068	Screw, BIDT2 4X12BZ
A514	23030815	Screw, PTD #6X 3/4
A518	23030815	Screw, PTD #6X 3/4
A519	23030815	Screw, PTD #6X 3/4
A521	23030815	Screw, PTD #6X 3/4
A533	23030815	Screw, PTD #6X 3/4
A535	23030815	Screw, PTD #6X 3/4
A539	23030815	Screw, PTD #6X 3/4
A541	23030815	Screw, PTD #6X 3/4
A543	72471068	Screw, BIDT2 4X12BZ
A544	23030815	Screw, PTD #6X 3/4
A701	23525844	Case
A703	23935847	Packing, Top
A708	23935848	Packing, Bottom
A721	23943628	Cover, Poly
K111	23430111	Delta, 77-A/BAssembly
K113	23430111	Delta, 77-A/BAssembly
K501	23837513	Lenti Sheet, SCREEN50KH-L
K502	23430608	Fresnel Sheet, SCREEN50KJ-F
K601	23430313	Mirror, MIRROR48(E)



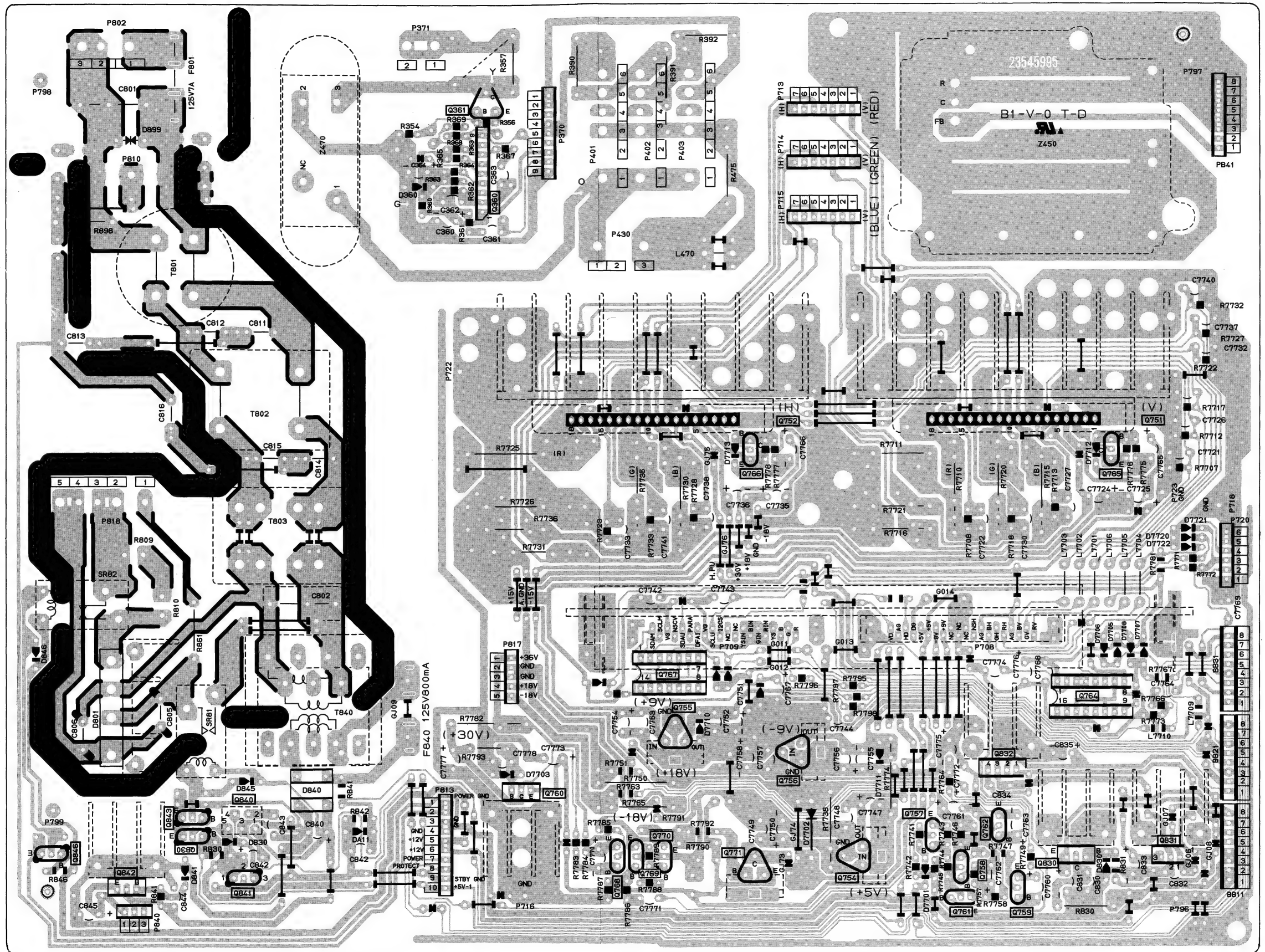
**BOTTOM (FOIL) SIDE**





# CONV-OUT BOARD PB8757A

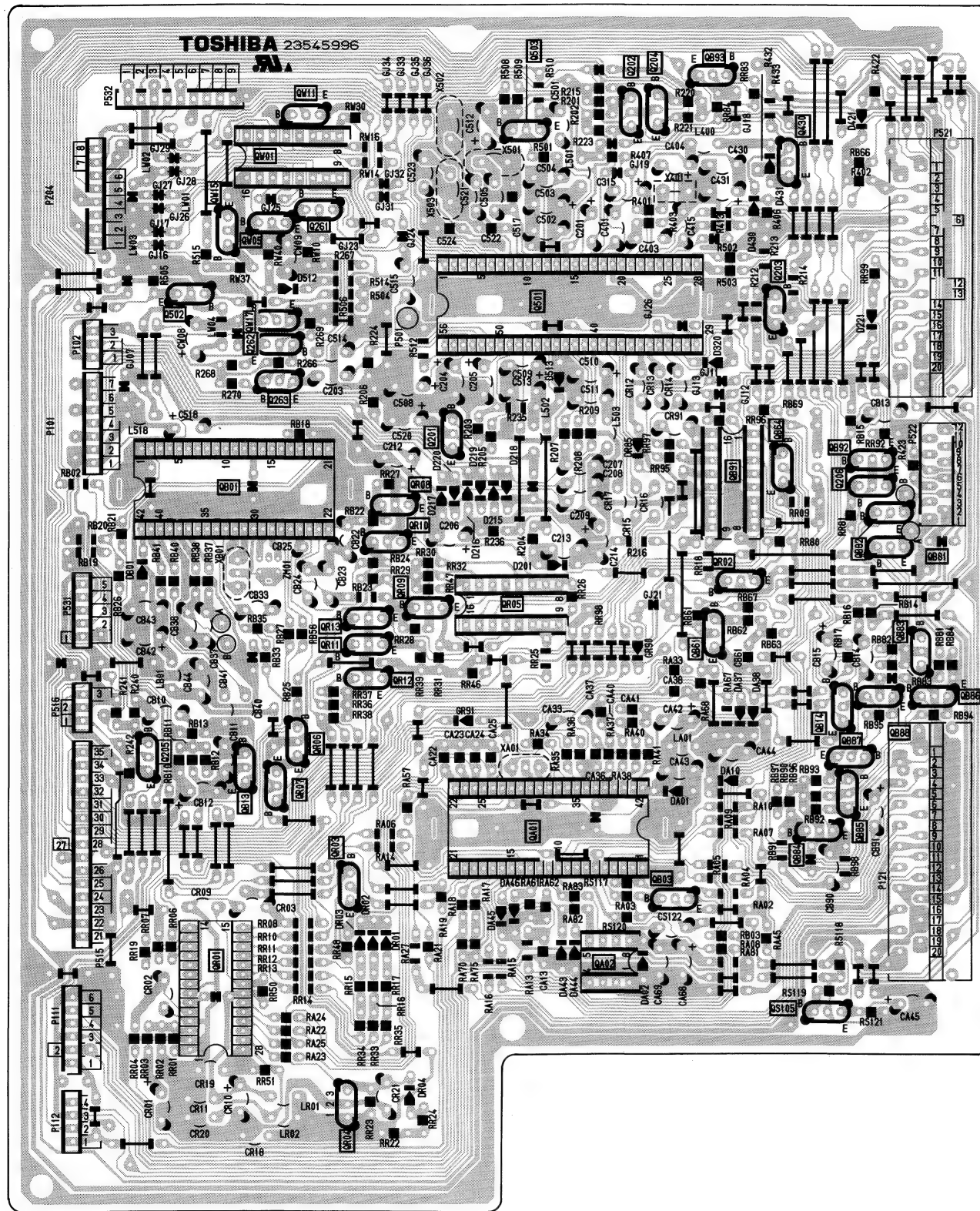
BOTTOM (FOIL) SIDE





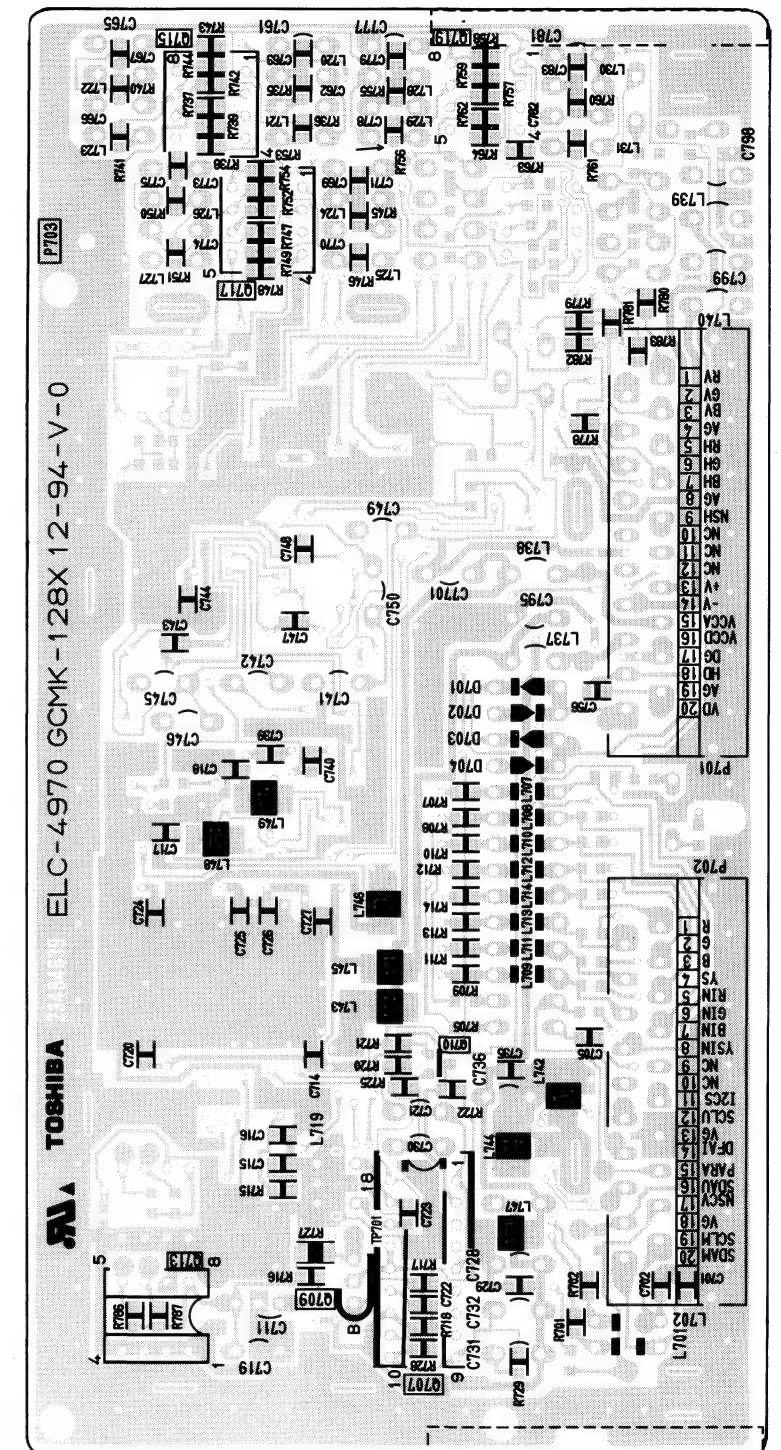
# VCD/MAICON BOARD PB8758A

BOTTOM (FOIL) SIDE



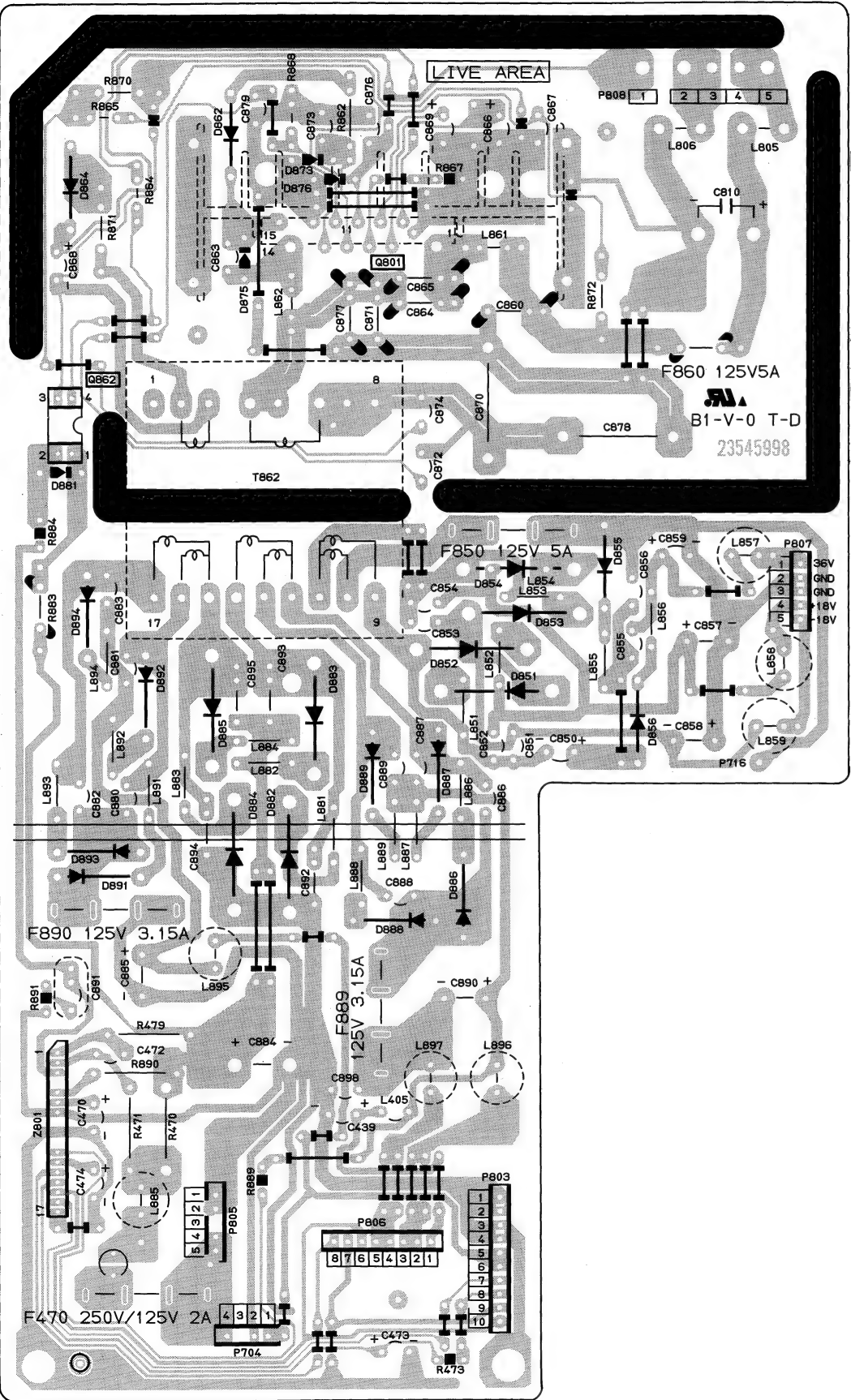
# DIGI-CONVER BOARD PB6340 (Reference)

BOTTOM (FOIL) SIDE

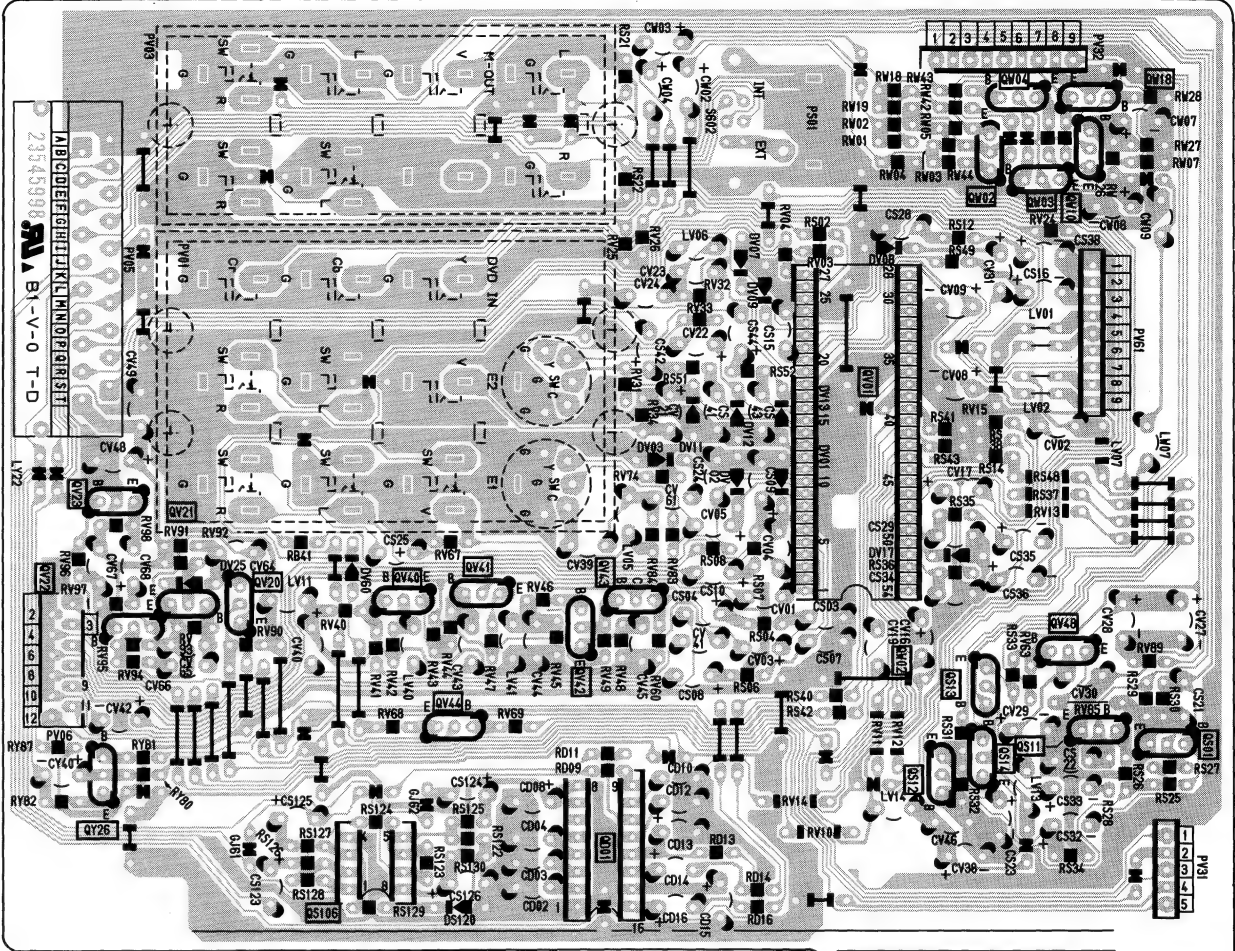




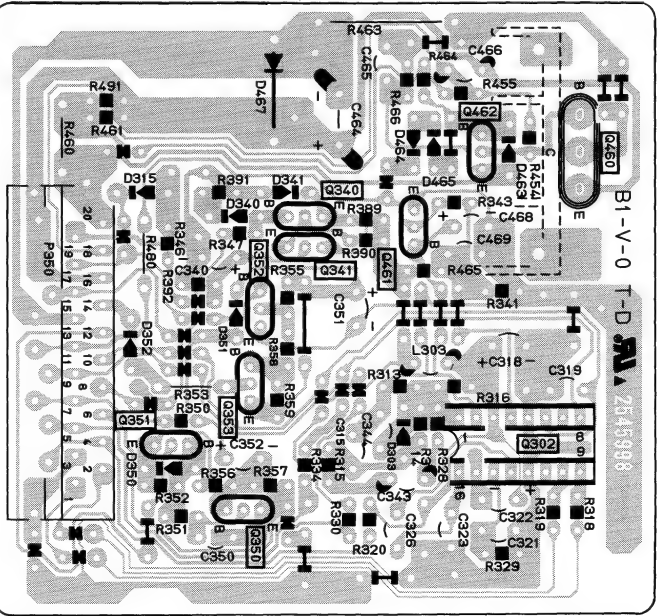
**POWER BOARD PB8760A-2**  
BOTTOM (FOIL) SIDE



**BACK/AV BOARD PB8760A-3**  
BOTTOM (FOIL) SIDE

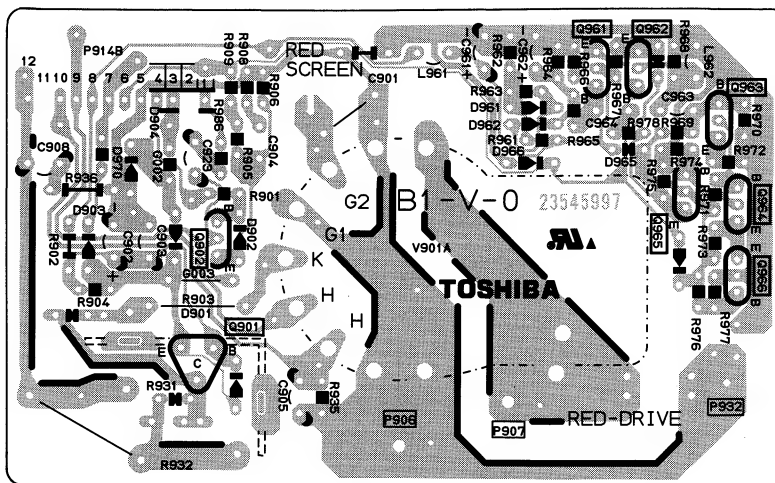


**DPC BOARD PB8760A-1**  
BOTTOM (FOIL) SIDE

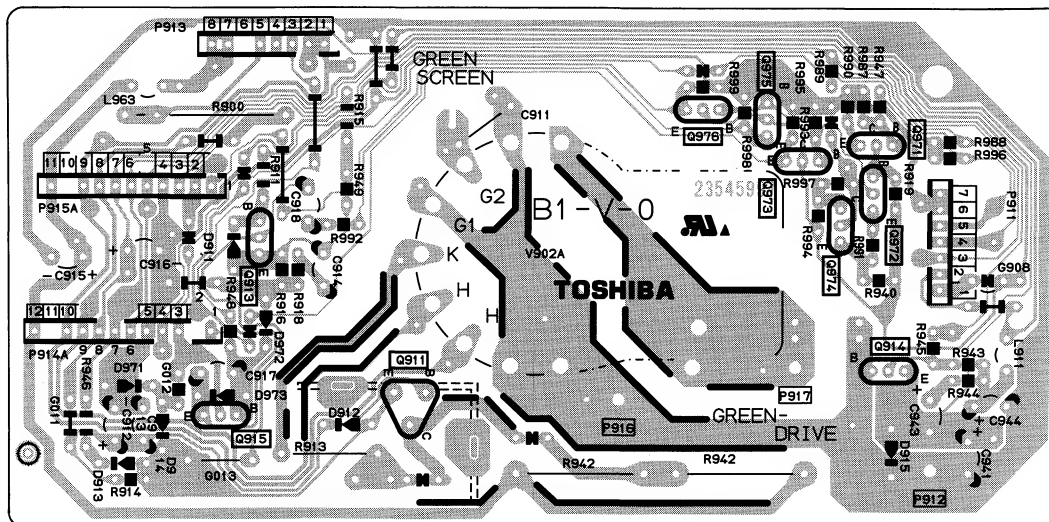




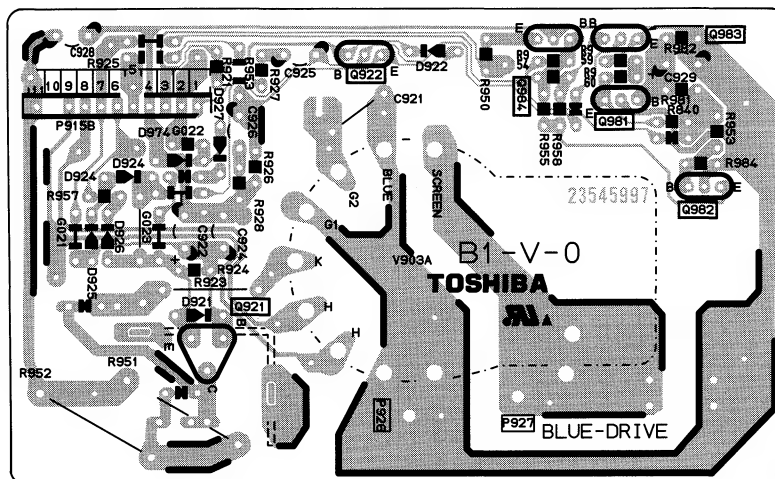
# **R-DRIVE BOARD PB8759A-1** **BOTTOM (FOIL) SIDE**



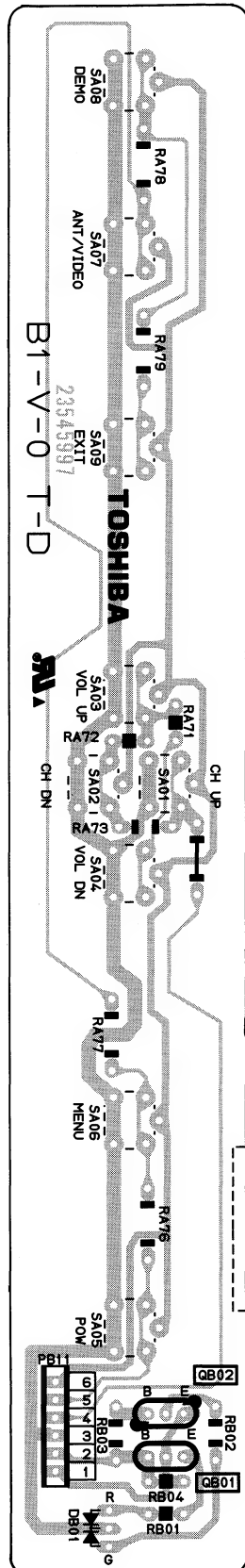
# **G-DRIVE BOARD PB8759A-2** **BOTTOM (FOIL) SIDE**



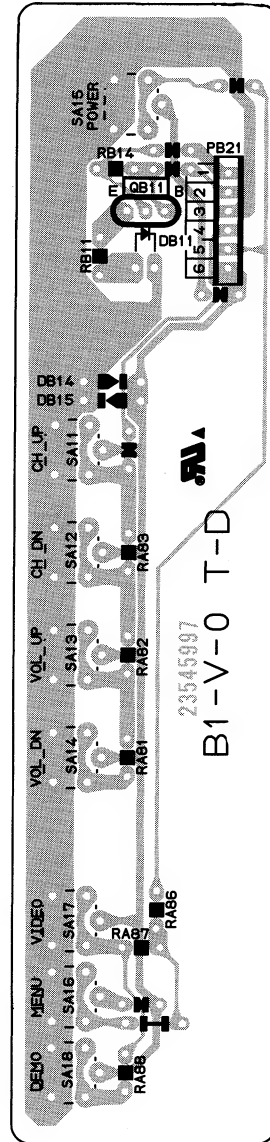
# **B-DRIVE BOARD PB8759A-3** **BOTTOM (FOIL) SIDE**



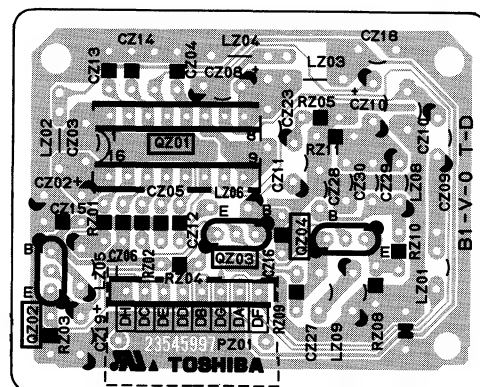
# **F-CONTROL BOARD PB8759A-4** **BOTTOM (FOIL) SIDE**



# **F-CONTROL BOARD PB8759A-8** **BOTTOM (FOIL) SIDE**

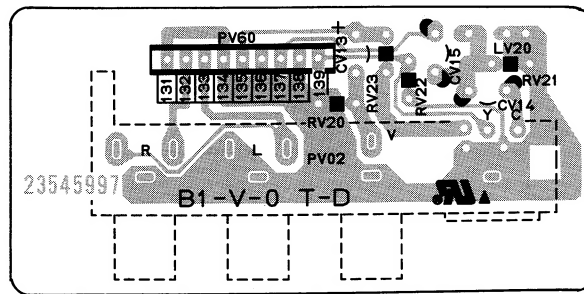


# **DIGI-COMB BOARD PB8759A-7** **BOTTOM (FOIL) SIDE**



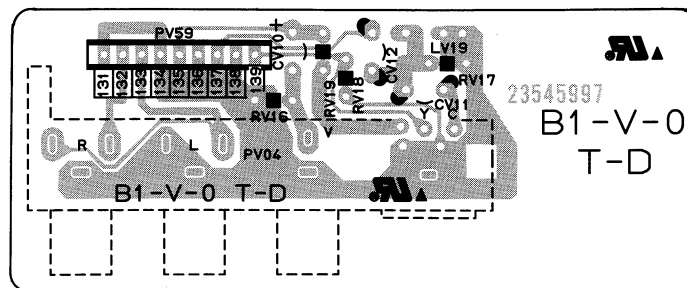
## FRONT-IN BOARD PB8759A-5

BOTTOM (FOIL) SIDE



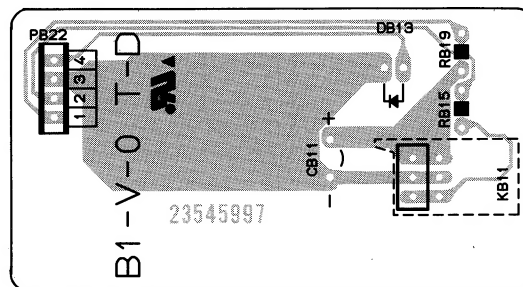
## FRONT-IN BOARD PB8759A-9

BOTTOM (FOIL) SIDE



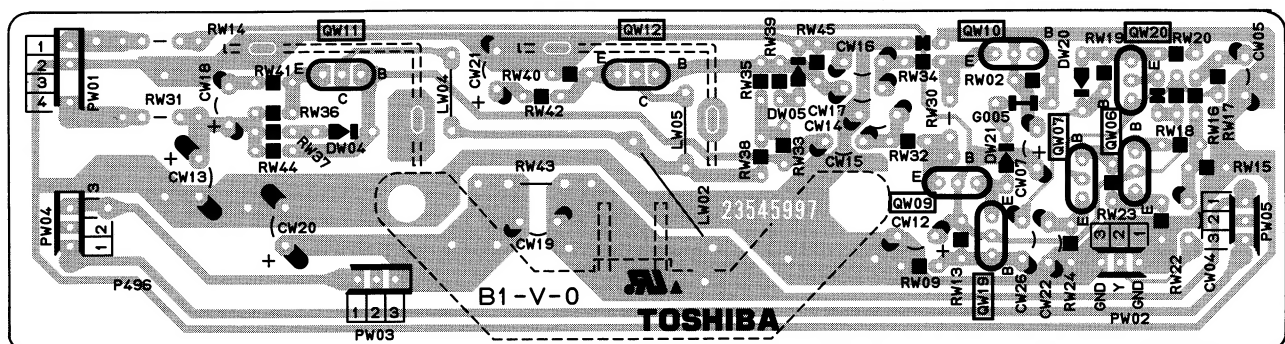
## REM BOARD PB8759A-10

BOTTOM (FOIL) SIDE



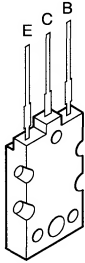
## SVM BOARD PB8759A-6

BOTTOM (FOIL) SIDE

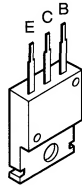


# TERMINAL VIEW OF TRANSISTORS

① 2SD2253  
(old)  
2SC5243



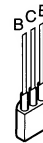
② 2SC3852  
2SD1763A  
2SC1569  
2SC4544  
2SA1788  
2SA1306  
2SA1186A



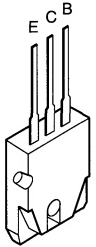
③ 2SC752GTM  
2SC2482  
2SC2655  
2SC4721P



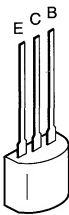
④ 2SC752  
2SA562TM  
2SA1015  
2SC1815  
2SC2878  
2SC1740S  
2SC2120  
2SA9335



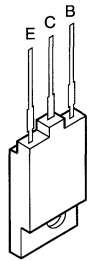
⑤ 2SA1788



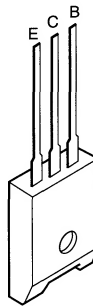
⑥ RN2203  
RN2201  
RN2004  
RN1203  
RN1204  
RN2204  
RN1205  
RN1202  
RN1201



⑦ 2SD1554  
2SD2253  
2SD1556  
2SD2553  
2SC5143



⑧ ON4409



**SPECIFICATIONS (Representative: TZ50V61)**

TELEVISION SYSTEM	NTSC standard							
CHANNEL COVERAGE	VHF: 2 through 13 UHF: 14 through 69 Cable TV: Mid band (A-8 through A-1, A through I) Super band (J through W) Hyper band (AA through ZZ, AAA, BBB) Ultra band (65 through 94, 100 through 125)							
POWER SOURCE	120 V AC, 60 Hz							
POWER CONSUMPTION	178W							
AUDIO POWER	14 W + 14 W							
SPEAKER TYPE	Two 6-1/4 inches (16 cm) round							
VIDEO/AUDIO TERMINALS	S-VIDEO INPUT (VIDEO 1/VIDEO 2) Y-INPUT: 1V (p-p), 75 ohm, negative sync. C-INPUT: 0.286 V(p-p) (burst signal), 75 ohm VIDEO 1/VIDEO 2/VIDEO 3 INPUT VIDEO: 1 V(p-p), 75 ohm, negative sync. AUDIO: 150 mV(rms) (30% modulation equivalent, 47 kohm) ColorStream™ (Color Difference) VIDEO, AUDIO INPUT Y-INPUT: 1 V(p-p), 75 ohm Cr-INPUT: 0.7 V(p-p), 75 ohm Cb-INPUT: 0.7 V(p-p), 75 ohm AUDIO: 150mV(rms). 47 kohm VIDEO/AUDIO OUTPUT VIDEO: 1 V(p-p), 75 ohm, negative sync. AUDIO: 150 mV(rms) (30% modulation equivalent, 4.7 kohm) VARIABLE AUDIO OUTPUT 0-350 mV(rms) (30% modulation equivalent, 4.7 kohm) AUDIO CENTER CHANNEL INPUT 1 V(rms) (30% modulation equivalent, 10 kohm)							
DIMENSIONS/MASS	<table border="1"> <thead> <tr> <th></th><th>Dimension (W/H/D)</th><th>Mass</th></tr> </thead> <tbody> <tr> <td>TZ50V61</td><td>42-1/4 x 50-9/16 x 20-25/32 inches (1,073 x 1,284 x 528 mm)</td><td>253 lbs (115 kg)</td></tr> </tbody> </table>			Dimension (W/H/D)	Mass	TZ50V61	42-1/4 x 50-9/16 x 20-25/32 inches (1,073 x 1,284 x 528 mm)	253 lbs (115 kg)
	Dimension (W/H/D)	Mass						
TZ50V61	42-1/4 x 50-9/16 x 20-25/32 inches (1,073 x 1,284 x 528 mm)	253 lbs (115 kg)						
SUPPLIED ACCESSORIES	Remote Control with 2 size "AA" alkaline batteries							

\*Please refer to owner's manual in detail.

# **TOSHIBA CORPORATION**

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN